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Review

Cognitive-behavioral high parental involvement treatments for pediatric obsessive-compulsive disorder: A meta-analysis

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ABSTRACT

A meta-analysis on the efficacy of cognitive-behavior-family treatment (CBFT) on children and adolescents with obsessive-compulsive disorder (OCD) was accomplished. The purposes of the study were: (a) to estimate the effect magnitude of CBFT in ameliorating obsessive-compulsive symptoms and reducing family accommodation on pediatric OCD and (b) to identify potential moderator variables of the effect sizes. A literature search enabled us to identify 27 studies that fulfilled our selection criteria. The effect size index was the standardized pretest-postest mean change index. For obsessive-compulsive symptoms, the adjusted mean effect size for CBFT was clinically relevant and statistically significant in the posttest (d_{adj} = 1.464). For family accommodation the adjusted mean effect size was also positive and statistically significant, but in a lesser extent than for obsessive-compulsive symptoms (d_{adj} = 0.511). Publication bias was discarded as a threat against the validity of the meta-analytic results. Large heterogeneity among effect sizes was found. Better results were found when CBFT was individually applied than in group (d_+ = 2.429 and 1.409, respectively). CBFT is effective to reduce obsessive-compulsive symptoms, but offers a limited effect for family accommodation. Additional modules must be included in CBFT to improve its effectiveness on family accommodation.

1. Introduction

Obsessive-compulsive disorder (OCD) is a debilitating condition characterized by obsessions (recurrent and intrusive thoughts) and/or compulsions (repetitive behaviors or mental acts) having serious consequences in an individual's daily life (American Psychiatric Association, 2013). Recent epidemiological studies have shown that OCD is relatively prevalent in children and adolescents, yielding similar rates (around 2%; Canals, Hernández-Martínez, Cosi, & Voltas, 2012) to those observed in adults (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). OCD is also often associated with other psychological disorders, such as tics, attention deficit-hyperactivity disorder, autism spectrum disorders (ASD) or depression, which increase degree of discomfort and complicate treatment and prognosis (Murray, Jassi, Mataix-Cols, Barrow, & Krebs, 2015; Storch, Lewin, Geffken, Morgan, & Murphy, 2010).

The significant impairment that young people experience with OCD has encouraged the development of interventions and assessments tailored to this population, and the effectiveness of programs has been these treatment tested in several studies in the past twenty years (Freeman et al., 2014; Rapp, Bergman, Piacentini, & McGuire, 2016; Rosa-Alcázar, Iniesta-Sepulveda, & Rosa-Alcázar, 2012). As in adults, the core component of pediatric interventions is exposure with response prevention (ERP), which is usually accompanied by complementary techniques such as psychoeducation, cognitive training, and relapse prevention (American Academy of Child and Adolescent Psychiatry Committee – AACAP– on Quality Issues, 2012).

Parental involvement is an essential component of successful and well-accepted treatment programs for children with OCD for several reasons. Poor functioning, high levels of distress and conflict, guilt, and accommodation behavior have been observed in the relatives of young people with OCD (Peris, Benazon, Langley, Roblek, & Piacentini, 2008). These behaviors and attitudes influence the course and maintenance of children's OCD (Barrett, Farrell, Dadds, & Boulter, 2005; Garcia et al.,

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2010; Peris et al., 2012). Family accommodation, in particular, has been observed as a predictor of symptom severity (Strauss, Hale, & Stobie, 2015; Wu et al., 2016) and poor response to CBT (Rudy, Lewin, Geffken, Murphy, & Storch, 2014). Thus, the inclusion of parents in pediatric interventions for OCD could bring potential benefits. First, given that exposure exercises are anxiety-provoking for children; they require family members to guide home-based exposure and encourage treatment compliance (Choate-Summers et al., 2008; Freeman et al., 2003). Second, when parents are engaged in accommodation behaviors (facilitating objects for rituals, providing reassurance or helping the child to avoid situations) opportunities for children to have corrective learning experiences in their natural environment are reduced, interfering with the habituation process. Accordingly, parental involvement focused on assisting exposure and reducing family accommodation is considered a safe and acceptable way of enhancing CBT efficacy (Storch, 2014; Taboas, McKay, Whiteside, & Storch, 2015).

The term Cognitive-Behavioral Family Treatment (CBFT) has been used for treatment programs that include a structured parental component, in which at least one parent attends the majority of treatment sessions, usually having been trained to reduce family accommodation, and to assist and encourage children during exposure exercises (Barrett, Healy-Farrell, & March, 2004; Freeman et al., 2008; Storch et al., 2007).

A number of RCTs have provided strong evidence supporting the effectiveness of CBFTs regarding the comparative efficacy with control conditions, in the first randomized controlled trial evaluating the efficacy of CFBT for pediatric OCD, Barrett et al. (2004) randomly assigned 77 children ages 7–17 to 14 weeks of individual CBFT, group CBFT or waitlist control group. Two treatment conditions were superior to the waitlist. In the study by Piacentini et al. (2011) findings demonstrated significant superiority of CBFT over relaxation training in reducing symptom severity, functional impairment and family accommodation in 71 children and adolescents from 8 to 17 years. Freeman et al. (2008, 2014) also compared a CBFT with an active control condition of family-based relaxation training including preschool children (ages 5 − 8), population that have been underrepresented in OCD treatment trials. Results showed that the percentage of participants achieving clinical remission was significantly higher in the CBFT condition relative to relaxation training. Lewin, Wu, McGuire, and Storch (2014) also evaluated the effectiveness of 12-session 6-week intensive family-based ERP program in very young children (ages 3–8). To reflect standard practice, treatment as usual (TAU) was used as a control condition. Results showed significant higher percentages of responder and remitters in ERP relative to TAU arm, demonstrating that very young children could be effectively treated using extant approaches for older children when developmentally-appropriate adaptations are included.

Several CBFT formats have been evaluated across a number of studies. Regarding individual and group format, equivalent therapeutic effects were observed in the mentioned study by Barrett et al. (2004). Family interventions can also be categorized into those that employ an intensive or a weekly approach. Storch et al. (2007) randomized forty participants (ages 7–17) to a 14-session intensive (daily) or weekly CBFT. At post-treatment, intensive condition showed slight superiority in remission and improvement rates, although both conditions were equivalent, at 3-month follow-up. Intensive treatment can be beneficial to those whose special circumstances (e.g., relocation, great impairment) require a faster response (Storch et al., 2006; Storch, Lewin et al., 2010). Finally, limited access to providers sufficiently trained in CBT for OCD, has encouraged the emergence of telecommunication-delivered programs in which parental inclusion is of particular importance in implementing interventions at home. Web-camera delivered CBFT have demonstrated superiority over waitlist condition in a RCT including 31 OCD youth between 7 and 16 years (Storch et al., 2011) Also, no significant differences were observed between a telephone-based and face-to-face CBFT in a randomized trial Turner et al. (2014).

Recent meta-analyses on psychological treatments for pediatric OCD have analyzed the influence of family involvement in the effectiveness reached by the interventions. Our previous works included family-based and non-family CBTs, coding two moderator variables: a) the degree of parental involvement as *minimal* (parents only received information), *moderate* (parents attended some sessions) or *high* (parents attended almost all sessions and were trained to assist children during exposures), b) the focus of the intervention (whether intervention focused on the child with OCD or on the whole family). Results of a meta-analysis including only randomized controlled trials showed that neither the level of family involvement nor the focus of treatment exhibited a significant relationship with the effect sizes (Sánchez-Meca, Rosa-Alcázar, Iniesta-Sepúlveda, & Rosa-Alcázar, 2014). Nevertheless, in a meta-analysis with both RCTs and open trials, level of parental involvement showed a positive and statistically significant association with the effect size for obsessive-compulsive symptoms (*minimal*: $d_+ = 1.45$, *moderate*: $d_+ = 1.54$, *high*: $d_+ = 2.26$), exhibiting a large percentage of variance explained of 34% (Rosa-Alcázar et al., 2015).

Thompson-Hollands et al., 2014Thompson-Hollands, Edson, and Comer (2014) conducted a meta-analysis including studies on the treatment of OCD in children and adults. They coded the level of family involvement in a 5-point scale from 1 *minimal involvement* (e.g., family members attended a portion of a single session and asked questions about the treatment) to 5 *extensive involvement* (e.g., a fully family-based treatment with relatives present for all sessions and actively involved in treatment activities). Results including 28 studies conducted until 2012 showed that level of family involvement did not influence the effectiveness of the interventions. They also analyzed the inclusion of family techniques in the treatment package, finding that targeting family accommodation influenced the effect sizes of general functioning outcomes (targeted: $d_+ = 1.09$ vs. not targeted: $d_+ = 0.58$).

1.1. Purpose of the study

As an extension of our previous work, the purpose of this meta-analysis was to examine the global effectiveness of CBT interventions for OCD with high parental involvement to improve obsessive-compulsive symptoms and family accommodation in children and adolescents. Although several meta-analyses on the efficacy of psychological treatments for pediatric OCD have already been published, a number of studies on the effectiveness of CBFTs for pediatric OCD have recently been conducted and eight were not included in the previous meta-analyses (Comer et al., 2014; Freeman et al., 2014; Lenhard et al., 2014; Lewin et al., 2014b; Skarphedinsson et al., 2015; Torp et al., 2015; Turner et al., 2014; Whiteside et al., 2014). Recent studies have examined different formats and modalities of implementation that could be moderators of the effectiveness. Additionally, the influence of psychological techniques included, as well as the intensity and duration of the parental component have not yet been analyzed.

With this in mind, the current study had two goals: 1) to analyze global effectiveness of CBFTs with extensive parental involvement for OCD in children and adolescents that used clinician-rated assessment of obsessive-compulsive symptoms with the Children's Yale-Brown Obsessive–Compulsive Scale (CY-BOCS; Scahill et al., 1997) and parent-report of family accommodation with the Family Accommodation Scale for Obsessive–Compulsive Disorder (FAS; Calvocoressi et al., 1995, 1999) at posttreatment and at follow-up, and 2) to examine the presence of possible moderator variables related to participants, interventions and methodologies used in the studies.

2. Method

2.1. Study selection criteria

In order to be included in this meta-analysis, studies had to fulfill the following selection criteria: (a) to examine the efficacy of CBTs for

OCD in participants younger than 19 years old, and diagnosed by standardized criteria (e.g. any version of the Diagnostic and Statistical Manual, DSM, or International Classification of Diseases, ICD); (b) to examine interventions with a high level of parental involvement (treatment programs which included parent-focused techniques and at least 70% of sessions included parents); (c) to include at least one treatment group with pretest and posttest measures and, optionally, follow-up measures; (d) the sample size in the posttest should be greater than four participants; therefore, single-case designs were excluded; (e) the study was required to include the CY-BOCS as outcome measure; (f) statistical data reported in the study had to allow us to compute the effect sizes, and (g) to be written in English or Spanish.

2.2. Search strategy

In the first place, several electronic databases were consulted: *Medline*, *PsycINFO, Psychology and Behavioral Sciences Collection (PBSC),* and *Google Scholar*, as well as the Spanish database *CSIC (ISOC)*. The following keywords were combined, in English and Spanish, in the electronic searches: ((obsessive-compulsive) or (OCD)) and ((treatment) or (cognitive behavioral therapy) or (CBT) or (exposure response prevention) or (ERP)) and ((family) or (parents)), which should be in the title or the

abstract. Second, the references of three meta-analyses cited above and five systematic reviews were consulted (Barrett, Farrell, Pina, Peris, & Piacentini, 2008; Himle, 2003; March, Franklin, Nelson, & Foa, 2001; Rosa-Alcázar et al., 2012; Rosa-Alcázar et al., 2015; Sánchez-Meca et al., 2014; Thompson-Hollands et al., 2014; Turner, 2006). Third, the references of the located studies were also reviewed. Finally, emails were sent to 22 experts in this area in order to locate unpublished studies.

The search strategy produced a total of 348 references. Fig. 1 presents a flowchart that summarizes the screening and selection process of the studies. Out of all of the studies revised, 27 articles fulfilled the selection criteria, all written in English and published between 1996 and June 2015.

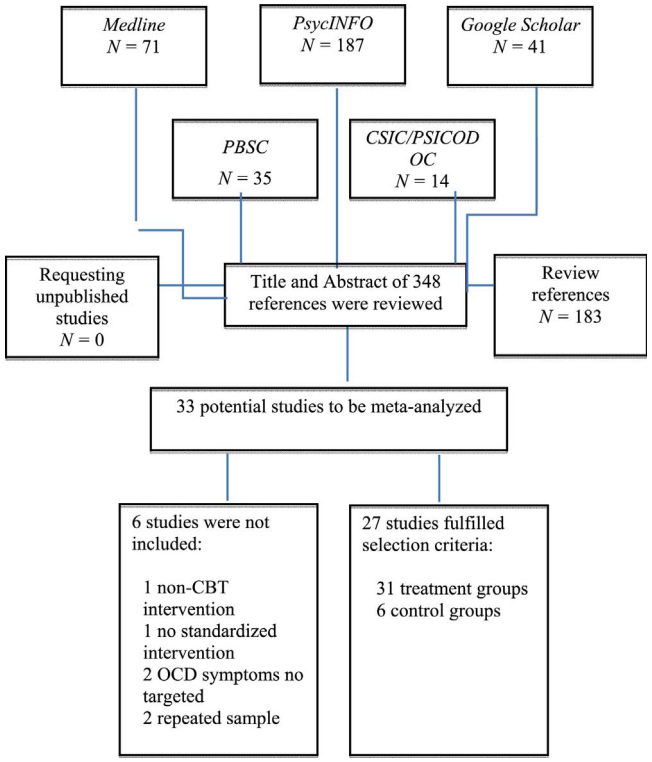

Fig. 1. Flow chart of the search strategy and study selection process.

The 27 articles produced a total of 31 groups that applied CBFT and 6 control groups. The total sample included 893 participants in the posttest measurements, with a median sample size of 29 participants. The studies came from the USA (58.1%), United Kingdom (12.9%), Australia (19.4%), and Scandinavian countries (Denmark, Norway, and Sweden; 9.7%). Although we endeavored to locate unpublished studies, all those included in the meta-analysis were published papers.

2.3. Coding of moderator variables

In order to examine the potential influence of characteristics of the studies on the effect sizes, potential moderator variables were coded. The *treatment variables* coded were: (a) the behavioral techniques applied to the OCD participants (psychoeducation, ERP, cognitive training, relapse prevention, contingency management, and motivational interview), (b) the behavioral techniques applied to the family (psychoeducation, decreasing accommodation instructions, contingency management training, exposure guidance training, problem solving, motivational interview, and emotional regulation); (c) the treatment duration for children and parents separately (number of weeks); (d) the treatment intensity for parents and children separately (number of weekly hours); (e) the treatment magnitude for parents and children separately (total number of intervention hours per participant); (f) the inclusion of a follow-up program (booster sessions); (g) family inclusion in session (parents and children together, parents and children apart, or both types of inclusion); (h) the mode of CBT (individual versus in group); (i) the format of the intervention delivered (direct or deferred); and (j) the CBFT protocol used.

Several *participant characteristics* were also coded: (a) the mean age of the sample (in years); (b) gender distribution (percentage of males); (c) the mean duration of the OCD (in years); (d) the percentage of ethnic minorities; (e) whether they had received any previous treatment or not, and (f) the presence of comorbidity and comorbid disorders (percentage of anxiety, depressive, eating, autism spectrum disorders, and conduct disorders, tics, and ADHD).

The *methodological variables* coded were: (a) the diagnostic criteria (any version of DSM, ICD or others); (b) the control of medication consumption (none, stable dose or medication not allowed); (c) the longest follow-up assessment (in months); (d) the attrition from pretest to posttest, and (e) the methodological quality of the study (on a scale of 0–6 points).[1]

The coding process was carried out in a standardized and systematic way since a codebook and a protocol for registering the variables[2] had previously been produced. The studies were coded independently by two separate coders specialized in the field of treatment of OCD. To assess the reliability of the coding process, 20% of the studies were randomly selected and subjected to a double coding process by two previously trained coders. The results showed very satisfactory inter-coder reliability, with kappa coefficients ranging from 0.85 to 1 for the qualitative variables, and intra-class correlations between 0.99 and 1 for the continuous ones.

2.4. Computation of effect sizes

To be as comprehensive as possible in our meta-analysis, we included both studies with and without a control group. This circumstance conditioned the election of the effect size index. In this meta-analysis the analysis unit was the group, not the study, and the effect

[1] The items comprising the methodological quality scale were: (1) random versus non-random assignment of participants to the groups; (2) the internal validity of the design (active control group, non-active control group or no control group); (3) the sample size in the postest; (4) attrition in the treatment group; (5) the use of intent-to-treat analysis, and (6) the use of blinded assessors in measuring the outcomes. Each one was rated from 0 to 1.

[2] Both documents can be obtained from the corresponding author upon request.

size index was the standardized mean change index, defined as the difference between the pretest and the posttest means divided by the pretest standard deviation: $d = c(m)(\bar{y}_{Post} - \bar{y}_{Pre})/S_{Pre}$, with $c(m)$ being a correction factor for small sample sizes (Hedges & Olkin, 1985). A d index was calculated for each of the 31 treatment group as well as for each of the six control groups included in the selected studies. To calculate effect sizes in the follow-ups, the same formula was used with the follow-up mean instead of the posttest mean. Positive values for d indicated a favorable change in the group from the pretest to the posttest (or from the pretest to the follow-up), and vice versa.

Separate effect sizes were calculated for obsessive-compulsive symptoms (measured by CY-BOCS) and for family accommodation (measured by FAS). For the assessment of the reliability of the effect size calculations, the same random sample of studies used in the coding reliability study was subjected to a double process of effect size calculations, obtaining excellent inter-coder reliability, with intra-class correlations of over 0.90.

2.5. Statistical analysis

Separate meta-analyses were carried out with the effect sizes for each outcome measure: CY-BOCS and FAS outcomes. In order to accommodate the variability exhibited by the effect sizes, random-effects models were assumed. To assess the heterogeneity of the effect sizes, the Q statistic and the I^2 index were calculated. For each outcome measure, a weighted mean effect size with its confidence interval was calculated. Given that our meta-analysis did not include any unpublished papers, an analysis of publication bias was carried out. The influence of moderator variables on the effect sizes was performed by assuming a mixed-effects model. Random- and mixed-effects models were applied in this meta-analysis and, therefore, each study was weighted according to its precision, which is mainly a function of the sample size: the larger the sample size, the larger the precision of the effect size. In order to examine the influence of moderator variables on the effect size variability, ANOVAs and meta-regressions were calculated for the qualitative and the continuous variables, respectively. In particular, to test the statistical significance of a moderator variable, Q_B and Q_R statistics were calculated for ANOVAs and meta-regressions, respectively. Q_W and Q_E statistics, respectively, were computed to assess the model misspecification. In addition, an estimate of the proportion of variance accounted for by the moderator variable was calculated by means of$R^2 = 1 - \hat{\tau}^2_{Res}/\hat{\tau}^2_{Total}$, with $\hat{\tau}^2_{Res}$ and $\hat{\tau}^2_{Total}$ being the residual and total heterogeneity variance estimates, respectively (López-López, Marín-Martínez, Sánchez-Meca, Van den Noortgate, & Viechtbauer, 2013). The statistical analyses were carried out with the statistical program *Comprehensive Meta-analysis Vers. 3.3* (Borenstein, Hedges, Higgins, & Rothstein, 2014).

3. Results

3.1. Distribution of effect sizes

Effect sizes and characteristics for each individual study included in the meta-analysis are shown in the Appendix. Table 1 presents the results obtained for the treatment and control groups in obsessive-compulsive symptoms (CY-BOCS) and in family accommodation (FAS), both in the posttest and in the follow-up. The follow-up periods had a mean duration of 4.35 ± 5.04 months (range 1–18 months).

Regarding obsessive-compulsive symptoms, the main outcome measure, the effect size obtained was statistically significant for the 31 treatment groups, reaching a large magnitude according to Cohen (1988) in the posttest ($d_+ = 2.30$) and for 22 treatments groups in the follow-up ($d_+ = 2.83$), reaching the statistical significance in both cases. The mean effect size yielded by the six control groups in the posttest was also statistically significant and with large magnitude ($d_+ = 0.83$). Fig. 2 presents a forest plot grouping the d indices as a function of the intervention applied (treatment vs. control). A weighted ANOVA applied to compare the mean effects of the treatment and control groups showed statistically significant differences in favor of CBFT ($Q_B(1) = 20.659$, $p < 0.0001$), with a 52% of variance explained. For controlling the d index overestimations for treatment groups, an adjusted mean effect, d_{adj}, was computed as the difference between the mean effect of the treatment groups, d_T, and the mean effect of the control groups, d_C: $d_{adj} = d_T - d_C$. Thus, for the global measures of obsessive-compulsive symptoms an estimate of the true treatment effect was $d_{adj} = 2.30–0.83 = 1.46$, an effect estimate that can still be considered of large magnitude (Cohen, 1988).

The family accommodation effect size obtained was statistically significant for the nine treatment groups that reported it, reaching a large magnitude according to Cohen (1988) in the posttest ($d_+ = 0.82$) and even greater for six treatment groups in the follow-up ($d_+ = 1.06$). The mean effect size yielded by the two control groups did not reach the statistical significance and showed a moderate effect ($d_+ = 0.31$) at posttest. The weighted ANOVA applied to compare the mean effects of the treatment and control groups showed statistically significant differences and a large percentage of variance explained of 68.5% ($Q_B(1) = 4.579$, $p = 0.032$]. In this case, the adjusted mean effect size was of a moderate magnitude: $d_{adj} = 0.82–0.31 = 0.51$.

3.2. Analysis of publication bias

All studies included in this meta-analysis were published papers. To assess the existence of publication bias the *fail-safe N* index was calculated (Rothstein, Sutton, & Borenstein, 2005). This index represents the number of unpublished studies averaging a null effect which must exist in order for the mean effect obtained in a meta-analysis to become zero. This safe number was $N_{fs} = 5k + 10 = 5 \times 31 + 10 = 165$. Taking the adjusted mean effect for obsessive-compulsive measures, $d_{adj} = 1.46$, the tolerance number for null results was equal to $N = 837$. As $N > N_{fs}$, publication bias can be discarded as a threat for our meta-analysis. In addition, the Egger test was applied to the 31 d indices obtained from the treatment groups. The Egger test consists of testing the statistical significance of the intercept in an unweighted simple regression between the d indices and their standard errors. Finding a non-statistically significant result for the intercept can be interpreted as evidence against publication bias. In our case, this result was obtained with the Egger test: $b_0 = 0.342$; $t(29) = 0.602$, $p = 0.552$. Finally, publication bias was also assessed by constructing a funnel plot and applying the Duval and Tweedie's (2000) 'trim-and-fill' method. Fig. 3 presents the funnel plot obtained with the 31 original d indices for the treatment groups. The trim-and-fill method imputed three values to achieve symmetry in the funnel plot. When a mean effect (and its 95% CI) was calculated with the 31 d indices plus the three imputed values, we obtained $d_+ = 2.24$ (95% CI: 1.97 and 2.52). If we compare the new mean effect with that obtained with the 31 original d indices ($d_+ = 2.30$; 95% CI: 1.99 and 2.59) negligible differences are seen. Therefore, the results obtained with the fail-safe N, the Egger test, and the funnel plot with the trim-and-fill method can be interpreted as discarding publication bias as a threat against the results of this meta-analysis.

3.3. Analysis of moderator variables

As Table 1 shows, the 31 effect sizes for the treatment groups exhibited large heterogeneity in obsessive-compulsive symptoms ($I^2 = 65.10\%$). Consequently, analyses were performed of the characteristics of the studies that could affect the effect size variability.

3.3.1. Treatment characteristics

One of the main objectives of this meta-analysis was to examine the differential effects of the various treatment techniques included in CBFTs. Table 2 presents weighted ANOVAs for the analysis of qualita-

Table 1
Results for the effect sizes as a function of the outcome measure for the treatment and control groups.

Outcome Measure	Treatment groups						Control Groups					
	k	Q	I^2	d_+	95% CI		k	Q	I^2	d_+	95% CI	
					d_l	d_u					d_l	d_u
CY-BOCS:												
Postest	31	85.972***	65.10	2.30	1.99	2.59	6	49.645***	89.9	0.83	0.28	1.39
Follow-up	22	51.743***	59.41	2.83	2.41	3.25	–	–	–	–	–	–
FAS:												
Postest	9	9.537	16.14	0.82	0.62	1.02	2	0.001	0	0.31	-0.10	0.71
Follow-up	6	10.566	52.69	1.06	0.58	1.53	–	–	–	–	–	–

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$. 95% C.I.: 95% confidence interval. k = number of studies. Q = heterogeneity statistic. I^2 = heterogeneity index (%). d_+ = mean effect size. d_l and d_u = lower and upper confidence limits.

tive moderator variables. In relation to the techniques applied on the children with OCD, 31 groups included psychoeducation, 31 groups applied ERP, 25 groups cognitive training, 23 groups relapse prevention, 9 groups booster sessions, 13 contingency management and one group motivational interview. Motivational interview was excluded from the analysis due to its limited use, and psychoeducation and ERP were also excluded as they were included in almost all treatment groups. As Table 2 shows, no relationship with effect size was found for the inclusion of cognitive training, relapse prevention, contingency management, or booster sessions. With regard to the techniques included in parent training component, 31 included psychoeducation, 24 groups targeted accommodation, 26 groups received exposure assistance training, 12 groups contingency management training, nine groups problem solving techniques, one group motivational interview, and one group emotional regulation techniques. Motivational interview and emotional regulation techniques were excluded from the analysis of moderator variables because of their limited use, and psychoeducation was also not used as it was included in all treatment groups. Similarly,

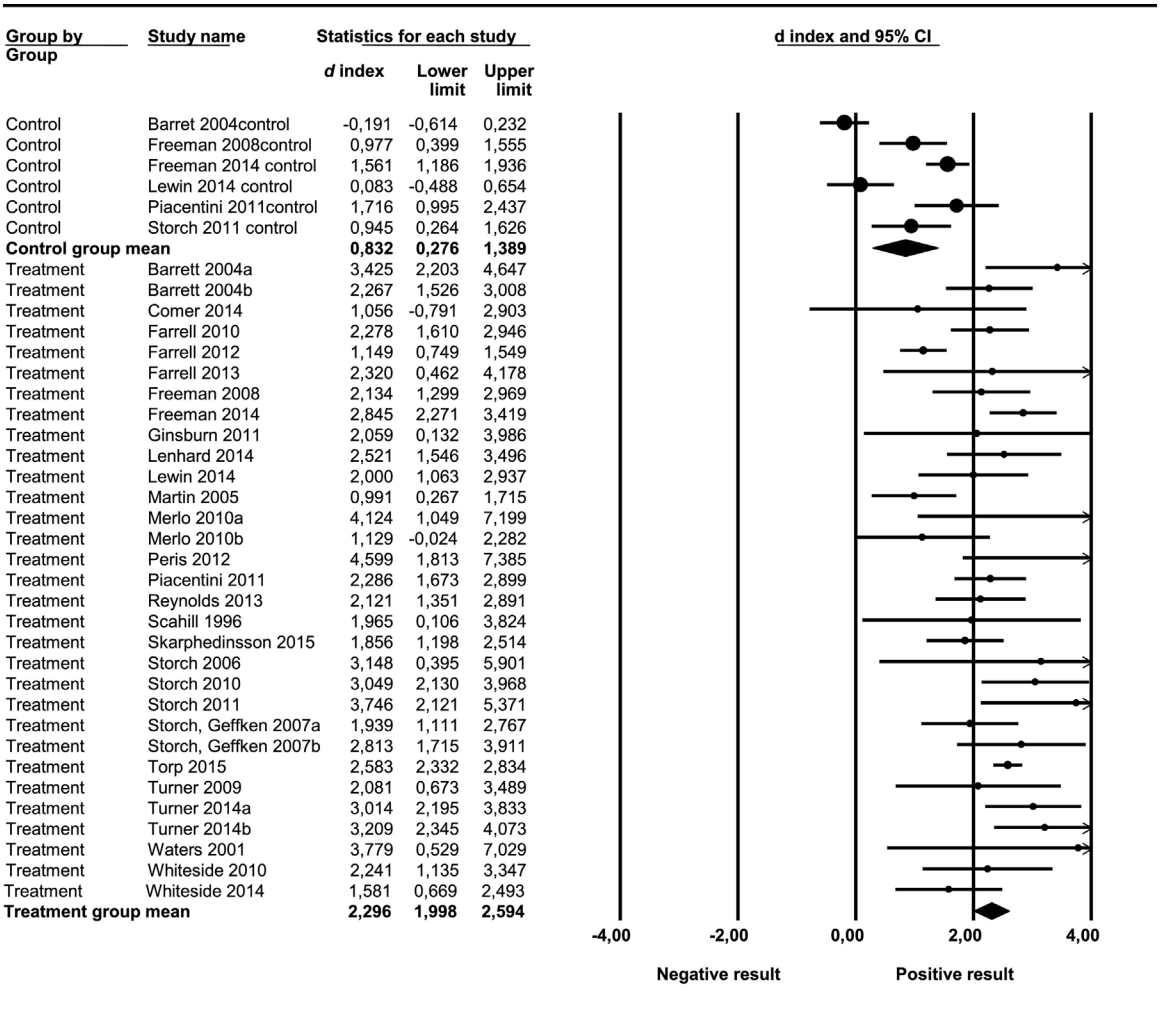

Fig. 2. Forest plot of the effect sizes for the obsessive-compulsive symptoms measured by CY-BOCS and grouped as a function of the type of intervention (treatment vs. control group). d index = standardized pretest-posttest mean change.

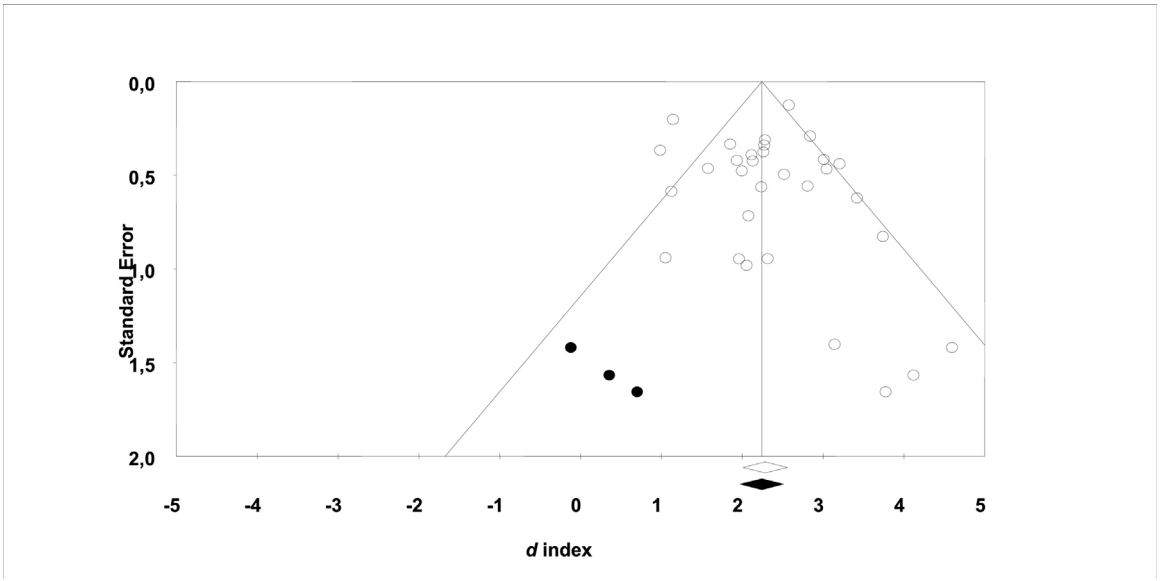

Fig. 3. Funnel plot of the 31 *d* indices for the treatment groups (white circles) together with three imputed values (black circles) when applying the Duval and Tweedie's (2000) 'trim-and-fill' method.

none of the techniques included in family component reached a statistically significant relationship with the effect size. In addition, no significant differences were found among the mean effects in exposure assistance training and problem solving.

Due to the existence of multicollinearity among the different techniques included in the CBFTs, two multiple meta-regressions were accomplished in order to examine the potential influence of the individual treatment techniques on the effect sizes. One of the two multiple meta-regressions, was applied on the three most relevant techniques included in the treatment of the OCD children: cognitive training, relapse prevention, and contingency management. The second regression model referred to four techniques included in the treatment to the parents: accommodation, contingency management, exposure assistance, and problem solving. Table 3 presents the results of the two meta-regressions. Regarding the techniques applied to the OCD children, none reached statistical significance once the influence of the remaining techniques included in the model was controlled. Further, the full model did not reach the statistical significance ($p = 0.601$), with 0% of variance accounted for. The multiple meta-regression on the techniques applied to the parents did not reach statistical significance either ($p = 0.727$), and none of the four techniques were statistically significant.

Table 2 also shows the ANOVAs carried out to analyze the influence of other characteristics related with the treatments. As shown, the mode of CBFT had a statistically significant association with the effect size ($p < 0.001$), exhibiting a large percentage of variance explained of 66% and with the mean effect for individual treatments ($d_+ = 2.43$) being higher than the mean effect for group treatments ($d_+ = 1.41$). ANOVAs conducted on the rest of qualitative treatment moderator variables, family inclusion, treatment protocol and format implementing treatment, did not reach statistical significance (see Table 2).

Table 4 presents the results of simple meta-regressions applied on continuous moderator variables. As Table 4 shows, for children, the median duration of interventions was 14 weeks, with an intensity of 1.5 h a week, and a total magnitude of about 15.5 h. For parental interventions, the median duration was 14 weeks, with an intensity of about one hour a week, and a total magnitude of 11 h. Simple meta-regression analyses with each of these moderator variables revealed non-statistically significant relationships with the effect sizes.

3.3.2. Participant characteristics

Two qualitative participant characteristics were analyzed: age groups included in the study (coded as children 4 − 12 years, adolescents 13–18 years, and mixed, both age groups included), and whether the participants had received previous treatment for OCD (≥ 50% of the sample versus < 50% in the sample). As Table 5 shows, the results of the ANOVAs applied on these moderator variables were not statistically significant. Table 4 presents other continuous variables related to the participants: The mean age of the children (median = 12.6 years), the percentage of males (median = 51.4%), the percentage of ethnic minorities (median = 10%), the years suffering from OCD (median = 3.36 years), the percentage of samples presenting two or more diagnoses (median = 69.7%), the percentage of each secondary diagnosis, the percentage of OCD children living with both parents (median = 52.4%), and the percentage of OCD children living with one parent (median = 27%). Only the percentage of autism spectrum disorders in the sample was statistically associated with the effect sizes ($p < 0.001$), with a large percentage of variance accounted for of 77%. The negative slope showed that the larger the percentage of children with autism in the sample, the lower the effect size. None of the rest of the continuous participant variables presented a significant relationship with the effect sizes.

3.3.3. Methodological characteristics

Tables 4 and 5 show the simple meta-regressions and ANOVAs, respectively, applied on continuous and qualitative methodological variables. None of the qualitative (control of medication consumption, type control medication consumption, and presence of control group) or continuous (attrition in the posttest, sample size, and quality design) methodological characteristics analyzed influenced the effect size of the treatment groups.

4. Discussion

The main purpose of this research was to investigate the efficacy of CBFT in reducing the obsessive-compulsive symptoms and family accommodation in pediatric OCD. Global adjusted effect size for the CY-BOCS presented a large magnitude, $d_{adj} = 1.45$, similar to the effect sizes reported for CBFTs (*d*s ranging from 1.68 to 2.03) in previous meta-analyses (Rosa-Alcázar et al., 2015; Sánchez-Meca et al., 2014; Thompson-Holland et al., 2014). In the same direction as results in previous meta-analysis (Rosa-Alcázar et al., 2015), the mean effect size obtained in the follow-ups indicated that reductions in obsessive-compulsive symptoms were not only maintained but were also in-

Table 2
Results of the ANOVAs for the influence of qualitative variables related with the treatment implementation on the effect sizes for obsessive-compulsive symptoms.

Moderator variable	k	d_+	95%C. I. d_l	95%C. I. d_u	ANOVA results
Cognitive training:					$Q_B(1) = 0.056$, $p = 0.812$
Yes	25	2.31	1.99	2.63	$R^2 = 0.0$
No	6	2.23	1.61	2.84	$Q_W(29) = 80.588$, $p < 0.001$
Relapse prevention:					$Q_B(1) = 1.266$, $p = 0.260$
Yes	23	2.02	1.49	2.56	$R^2 = 0.0$
No	8	2.39	1.06	2.71	$Q_W(29) = 85.977$, $p < 0.001$
Contingence management:					$Q_B(1) = 0.140$, $p = 0.108$
Yes	13	2.35	1.92	2.78	$R^2 = 0.0$
No	18	2.24	1.87	2.62	$Q_W(29) = 85.160$, $p < 0.001$
Booster sessions:					$Q_B(1) = 0.146$, $p = 0.702$
Yes	9	2.11	1.60	2.63	$R^2 = 0.0$
No	12	2.25	1.76	2.74	$Q_W(19) = 51.298$, $p < 0.001$
Parents Training (Accommodation):					$Q_B(1) = 0.036$, $p = 0.850$
Yes	24	2.27	1.96	2.59	$R^2 = 0.0$
No	7	2.34	1.73	2.95	$Q_W(29) = 85.434$, $p < 0.001$
Parents Training (Contingence management):					$Q_B(1) = 0.150$, $p = 0.698$
Yes	12	2.36	1.91	2.81	$R^2 = 0.0$
No	19	2.25	1.89	2.60	$Q_W(29) = 85.185$, $p < 0.001$
Parents Training (Exposure Assistance):					$Q_B(1) = 0.455$, $p = 0.500$
Yes	26	2.33	2.03	2.63	$R^2 = 0.0$
No	5	2.06	1.35	2.77	$Q_W(29) = 83.648$, $p < 0.001$
Parents Training (Problem solving):					$Q_B(1) = 1.964$, $p = 0.161$
Yes	9	2.38	2.09	2.66	$R^2 = 0.0$
No	22	1.98	1.51	2.45	$Q_W(29) = 61.942$, $p < 0.001$
Family inclusion:					$Q_B(2) = 2.432$, $p = 0.296$
Together	16	2.31	1.91	2.71	$R^2 = 0.0$
Separate	3	2.87	2.02	3.73	$Q_W(28) = 77.838$, $p < 0.001$
Mixed	12	2.12	1.69	2.54	
Format:					$Q_B(1) = 0.082$, $p = 0.774$
Direct	27	2.27	1.98	2.57	$R^2 = 0.0$
Deferred	4	2.41	1.52	3.31	$Q_W(29) = 85.666$, $p < 0.001$
Mode of CBFT:					$Q_B(1) = 12.388$, p .001 < 0.001
Individual	27	2.43	2.19	2.67	$R^2 = 0.66$
Group	3	1.41	0.89	1.93	$Q_W(28) = 45.210$, $p < 0.001$
Protocol:					$Q_B(8) = 4.376$, $p = 0.822$
FOCUS (Barrett, 2009)	4	2.60	1.85	3.35	$R^2 = 0.0$
BIP OCD (Lenhard et al., 2014)	1	2.52	1.11	3.93	$Q_W(16) = 37.269$, $p < 0.001$
FBT (Freeman & Garcia, 2008)	3	2.32	1.51	3.12	
Intensive CBT (Lewin et al.)	5	2.28	1.52	3.04	
CBT (Piacentini et al., 2007)	3	2.28	1.62	2.94	
Breaking free from OCD	1	2.12	0.84	3.40	
Internet CBT (Ginsburn et al.)	1	2.06	-0.12	4.30	
CBT (March & Mulle, 1998)	5	2.03	1.38	2.69	
OCD Busters (Farrell & Waters, 2008)	2	1.40	0.42	2.37	

k = number of studies. d_+ = mean effect size for each category. 95% C.I. = 95% confidence interval for d_+. d_l and d_u = lower and upper confidence limits around d_+. Q_B = between-categories statistic. Q_W = within-categories statistic. R^2 = proportion of variance explained. FOCUS: From Obsessions and Compulsions Using Cognitive-Behavioral Strategies. FBT: Family Behavior Therapy; CBT: Cognitive Behavioral Therapy

creased. Regarding results for family accommodation, global adjusted effect size was moderate in this meta-analysis ($d_{adj} = 0.51$) being similar to the adjusted effect size reported by Rosa-Alcázar et al. (2015) for family functioning measures.

In the follow-ups the mean effect size for family accommodation obtained from six studies was greater, exhibiting a large magnitude ($d_+ = 1.06$), although this effect size was not adjusted due to there being no control groups at follow-ups. This finding differs to that observed in a previous meta-analysis, where the mean effect for this variable at follow-up was very low and non-statistically significant ($d_+ = 0.15$, Rosa-Alcázar et al., 2015). Surprisingly, these findings reflected the limited effect of CBFTs in family accommodation despite high parental involvement in these interventions, which could be indicative of the need for including additional modules targeting family accommodation with explicit instructions to reduce negative reinforcement of children's symptoms and facilitate alternate ways of coping (Iniesta-Sepúlveda, & Storch, 2016; Taboas et al., 2015). Nevertheless, results on family accommodation should be interpreted with caution since only nine studies provided data on this outcome. These results cause concern given the importance of family accommodation for course and maintenance of OCD in childhood (Piacentini et al., 2011; Wu et al., 2016) and its consequences for treatment (Lebowitz, 2013; Rudy et al., 2014; Wu et al., 2016). Accordingly, studies focusing on reducing family accommodation should include measures and strategies allowing an objective assessment of this phenomenon and its improvement after intervention.

The second goal was to examine the presence of possible moderator variables related to participants, interventions and methodologies used in the studies. As regards the characteristics of the interventions, all treatments included psychoeducation and ERP impeding the comparative analysis in relation to the presence of these techniques. Weighted ANOVAs did not show significant differences when the remaining techniques (cognitive training, relapse prevention, booster sessions, and contingency management) were included or not. In previous meta-analyses, only relapse prevention showed a significant relationship with the effect sizes (Rosa-Alcázar et al., 2015) whereas others did not find significant influence of any treatment technique on effect sizes (Sánchez-Meca et al., 2014). One of the main interests in the current

Table 3
Results of the multiple *meta*-regressions for the treatment techniques applied to the OCD children and for those applied to their parents.

Model 1: Treatment techniques for OCD children	b_j	SE_j	Z	p
Intercept	1.674	0.523	3.20	.001
Cognitive training	0.471	0.363	1.30	.195
Relapse prevention	0.260	0.388	0.67	.502
Contingence management	0.167	0.308	0.54	.589
Results of the full model:	$Q_R(3) = 1.86$, $p = 0.601$; $R^2 = 0.0$			
	$Q_E(27) = 77.78$, $p < 0.001$			
Model 2: Treatment techniques for parents	b_j	SE_j	Z	p
Intercept	1.912	0.563	3.39	< 0.001
Accommodation	0.234	0.523	0.62	0.536
Contingence management	−0.287	0.471	−0.61	0.543
Exposure assistance	0.429	0.477	0.90	0.369
Problem solving	−0.531	0.441	−1.21	0.228
Results of the full model:	$Q_R(4) = 2.05$, $p = 0.727$; $R^2 = 0.08$			
	$Q_E(26) = 58.80$, $p < 0.001$			

b_j = regression coefficient. SE_j = standard error of the regression coefficient. Z = statistic to test the statistical significance of the predictor variable. Q_R = statistic to test the statistical significance of the full model. Q_E = statistic to test the model misspecification. R^2 = proportion of variance accounted for by the set of predictor variables.

meta-analysis was to examine the moderator effects of different techniques included in the parental component of interventions, but results showed no significant relationship between parent techniques (targeting accommodation, exposure assistance training, contingency management training, and problem solving) and effect sizes. Nevertheless, the greatest effect sizes were observed for interventions that included parent assistance training and problem solving. In this sense, Thompson-Hollands et al. (2014) reported differences in favor of interventions targeting family accommodation but only for functional impairment outcomes. Finally, multiple meta-regression models to test the potential contribution of the individual treatment techniques on the

Table 5
Results of the ANOVAs for the influence of qualitative methodological and participant variables on the effect sizes for obsessive-compulsive symptoms.

Moderator variable	k	d_+	95%C. I.		ANOVA results
			d_l	d_u	
Participant characteristics					
Age group:					$Q_B(2) = 2.045$, $p = 0.359$
Children	5	2.21	1.52	2.90	$R^2 = 0.0$
Adolescents	4	2.78	2.05	3.52	$Q_W(28) = 78.263$, $p < 0.000$
Mixed	22	2.21	1.88	2.53	
Previous treatments for OCD					$Q_B(1) = 0.140$, $p = 0.708$
≥50% of the sample	26	2.27	1.96	2.59	$R^2 = 0.0$
< 50% of the sample	2	2.45	1.58	3.32	$Q_W(26) = 68.601$, $p < 0.000$
Methodological characteristics					
Control medication consumption:					$Q_B(1) = 2.681$, $p = 0.101$
No	2	1.51	0.51	2.51	$R^2 = 0.0$
Yes	27	2.38	2.08	2.68	$Q_W(27) = 76.371$, $p < 0.000$
Type control medication consumption:					$Q_B(1) = 0.320$, $p = 0.572$
Stable dose	22	2.43	2.08	2.78	$R^2 = 0.0$
Not allowed	5	2.21	1.52	2.90	$Q_W(25) = 70.208$, $p < 0.000$
Presence of control group:					$Q_B(1) = 1.149$, $p = 0.283$
No	23	2.21	1.87	2.54	$R^2 = 0.0$
Yes	7	2.56	2.01	3.10	$Q_W(28) = 82.143$, $p < 0.000$

k = number of studies. d_+ = mean effect size for each category. 95% C.I. = 95% confidence interval for d_+. d_l and d_u = lower and upper confidence limits around d_+. Q_B = between-categories statistic. Q_W = within-categories statistic. R^2 = proportion of variance explained.

Table 4
Results of the simple *meta*-regressions of the continuous variables on the effect sizes for obsessive-compulsive measures.

Cluster/moderator variable	k	Min.	Max.	Mdn	b_j	Q_R	Q_E	R^2
Treatment characteristics:								
Children								
Treatment duration	31	1.00	17.00	14.00	0.011	0.138	85.977*	0.0
Treatment intensity	24	0.71	8.60	1.50	−0.008	0.021	75.435*	0.0
Treatment magnitude	24	9.00	21.00	15.56	−0.021	0.293	75.435*	0.0
Parents								
Treatment duration	31	1.00	17.00	14.00	0.011	0.139	85.977*	0.0
Treatment intensity	26	0.30	9.00	1.03	−0.004	0.005	83.805*	0.0
Treatment magnitude	26	2.30	21.00	11.00	−0.017	0.469	83.805*	0.0
Participant characteristics								
Mean age	31	5.76	15.00	12.59	0.027	0.239	84.568*	0.0
Gender	30	31.00	80.00	51.40	−0.008	0.438	74.677*	0.0
Percentage ethnic minority	19	0.00	40.00	10.00	0.014	0.809	26.291*	0.0
OCD history	10	2.00	4.60	3.36	0.239	0.420	22.863*	0.0
Comorbidity% Total	20	40.50	98.70	69.70	0.005	0.157	53.253*	0.0
% Anxiety disorders	13	19.30	98.70	53.10	0.001	0.005	15.067	0.0
% Depressive disorders	20	0.00	28.50	9.70	0.002	0.005	54.831*	0.0
% ADHD	23	0.00	43.00	19.00	−0.016	1.751	56.428*	0.0
% Tics	20	0.00	43.00	8.90	0.030	2.876	45.190*	0.0
% Conduct disorders	19	0.00	35.00	3.70	0.013	0.674	53.550*	0.0
% Autism spectrum disorders	15	0.00	35.00	0.00	−0.040	43.488*	12.661	0.77
% Eating disorders	12	0.00	14.00	0.00	−0.014	0.067	14.804	0.0
% living with both parents	10	52.40	100.0	52.40	−0.002	0.024	11.268	0.0
% living with one parent	8	0.00	47.60	27.00	−0.002	0.014	11.151	0.0
Methodological variables								
Attrition	31	0.00	0.80	0.00	1.03	1.623	77.561*	0.0
Sample size	31	5.00	269.0	20.00	0.002	0.481	75.764*	0.0
Methodological quality	31	0.70	6.00	3.9	0.164	2.453	71.971*	0.0

** $p < 0.001$. k = number of studies. b_j = regression coefficient. Q_R = statistic for testing the significance of the moderator variable. Q_E = statistic for assessing the model misspecification. R^2 = proportion of variance explained. Min. and Max. = minimum and maximum values of the moderator. Mdn = median.

effect sizes did not reach statistical significance, once the influence of the remaining techniques was controlled. These findings may reflect that the majority of intervention programs included the same core components (psychoeducation, ERP).

Other treatment features of the interventions were also analyzed. The treatment format reached statistical significance. Treatments that were individually applied exhibited greater effect sizes compared to those implemented in group. Nevertheless we should point out that only three interventions were delivered in group format. Similarly, findings in a previous meta-analysis showed that individual interventions yielded larger effects than group treatments for global functioning outcomes (Thompson-Hollands et al., 2014). These results suggest that tailoring protocols to address the individual needs of families could be relevant and improve the efficacy of CBFT, always maintaining the most active components (Wu & Storch, 2016). None of the remaining variables analyzed demonstrated a significant influence on effect sizes, but it is worth highlighting that the most investigated protocols were those by March and Mulle (1998) adding parental involvement, and the most intensive by Lewin et al. (2005). There were no significant differences among CBFT protocols, although the largest effect was obtained by the four studies evaluating the FOCUS by Barrett (2009).

In analysis of participants' characteristics, only comorbidity presented a significant relationship with the effect sizes, exhibiting the lowest effect size studies that included children with autism spectrum disorders. Although other meta-analyses did not report the influence of comorbidity on effect sizes, some empirical evidence showed that the presence of ASD in young people with OCD resulted in lower improvements than in participants with only OCD (Murray et al., 2015). Core features in ASD (deficits in cognition, communication, abstraction and inflexibility) represent additional barriers to implementation of CBT (Storch et al., 2010) and modifications in standard programs are necessary to guarantee optimal efficacy in this population (Ung, Selles, Small, & Storch, 2015). Nevertheless, the small number of studies including OCD children with comorbid ASD, in the current meta-analysis, limits the generalizability of that finding. The analysis of methodological moderators showed an absence of study characteristics statistically associated to the effect size variability.

Our results have clear implications for clinical practice with pediatric OCD patients. First, the efficacy of CBT using a family-based approach to reduce obsessive-compulsive symptoms in children and adolescents has been demonstrated according to improvements reflected in the gold standard clinician administered interview (CY-BOCS) in both short- and long-term assessments. Thus, when possible, parents should be routinely involved in the intervention with the purpose of facilitating generalization of learning skills across settings through encouraging and assisting between-session exposures and decreasing family accommodation behaviors. When family behavior impedes the child's coping of feared situations, OCD becomes more resistant and severe. Therefore, CBFT could contribute to reducing chronicity of OCD providing benefits to patients and mental health services. Second, moderate results in family outcomes reflect the need to improve parent training modules (e.g., providing clear and explicit instructions to reduce accommodation) and family accommodation measures. Third, the individual format seems to be superior to the group format in addressing the particular presentation and family impact of OCD in each patient.

Some limitations in the current meta-analysis should be mentioned. First, the number of experimental studies included in the meta-analysis was reduced. The inclusion of studies without control group forces meta-analysts to use an effect size index with low internal validity, conditioning the scope of the results. However, including group designs with random allocation as well as psychological placebo control conditions in the primary studies, allowed us to estimate the non-specific effects of the interventions. Second, ethical issues prevent us from including follow-up measures in control groups. This hampered obtaining a valid estimate of the long-term effects of treatments. Third, primary studies reported limited information about important characteristics related to the treatment applied, such as a detailed description of the specific techniques delivered with parents, distribution of comorbidity in the sample or illness duration. These deficiencies affect the capability of meta-analyses to detect moderator variables and limit the scope and generalizability of our meta-analytic findings. Fourth, surprisingly, family accommodation was assessed only in a few studies, preventing us from establishing conclusions about the effect of interventions on this outcome.

Although the current findings point towards the beneficial effect of parental involvement on CBT efficacy in improving pediatric OCD, future randomized comparison studies are needed to confirm the superiority of CBFT over interventions with limited parental involvement. Also, future research studies should include outcome measures on family variables such as accommodation behaviors, and detailed descriptions of techniques used to address this issue, since to date it has been difficult to establish definitive conclusions about treatment effects in this variable. It would also be useful for future studies to provide more detailed descriptions about how exposures are carried out (number of exposures per day, duration, etc.) and define the specific role played by parents (observers, cotherapists, etc.).;1; Finally, analyzing differential efficacy according to other family characteristics such as parental anxiety, family conflict, divorce, etc., is also considered of particular importance.

Appendix A

Some characteristics and effects sizes for individual studies included in the meta-analysis

Study	*N*	Mean age	Mode	Delivery format	OCD Treatment techniques	Treatment intensity children	Family components	Treatment intensity parents	Design	*d*
Barrett et al. (2004)	24	10.75	Individual	Direct	PE + ERP + CT + RP	1.00	PE + TAC + EAT + PS	0.66	RCT	3.42
Barrett et al. (2004)	29	12.90	Group	Direct	PE + ERP + CT + RP	1.00	PE + TAC + EAT + PS	0.66	RCT	2.27
Comer et al. (2014)	5	6.50	Individual	Internet	PE + ERP + CT	–	PE + TAC + EAT + CMT	–	Case series	1.06
Farrell et al. (2010)	33	12.29	Both	Direct	PE + ERP + CT + RP	1.50	PE + TAC + EAT + PS	0.36	Open trial	2.28
Farrell et al. (2012)	43	11.09	Group	Direct	PE + ERP + CT + RP	1.50	PE + TAC + EAT + PS	0.63	Open trial	1.15
Farrell et al. (2013)	8	13.11	Individual	Direct	PE + ERP	1.50	PE	0.50	RCT	2.32

					+ CT + RP		+ TAC + EAT + PS			
Freeman et al. (2008)	16	7.11	Individual	Direct	PE + ERP + CT	0.71	PE + TAC + EAT + PS + CMT	1.14	RCT	2.13
Freeman et al. (2014)	59	7.40	Individual	Direct	PE + ERP + CT	0.71	PE + TAC + EAT + PS + CMT	0.93	RCT	2.85
Ginsburg et al. (2011)	7	6.00	Individual	Direct	PE + ERP + RP	0.72	PE + TAC + EAT + PS + CMT	1.25	Case series	2.06
Lenhard et al. (2014)	21	14.40	Individual	Internet	PE + ERP + RP	–	PE + TAC	–	Open trial	2.52
Lewin et al. (2014b)	17	5.76	Individual	Direct	PE + EPR + RP	2.00	PE + TAC + EAT + CMT	2.00	RCT	2.00
Martin & Thienemann (2005)	14	11.30	Group	Direct	PE + ERP + CT	1.50	PE + TAC + PS	1.50	Open trial	0.99
Merlo et al. (2010)	8	13.30	Individual	Direct	PE + ERP + CT + RP + MI	5.37	PE + EAT + MI	1.50	RCT	4.12
Merlo et al. (2010)	8	13.30	Individual	Direct	PE + ERP + CT + RP	6.87	PE + EAT	1.50	RCT	1.13
Peris et al. (2012)	10	11.50	Individual	Direct	PE + EPR + CT	1.28	PE + TAC + PS	0.43	RCT	4.60
Piacentini et al. (2011)	41	12.40	Individual	Direct	PE + ERP + CT + RP	1.30	PE + TAC	0.57	RCT	2.29
Reynolds et al. (2013)	19	14.60	Individual	Direct	PE + ERP + CT + RP	–	PE + TAC + EAT + CMT	–	RCT	2.12
Scahill et al. (1996)	7	13.00	Individual	Direct	PE + ERP + CT + RP	–	PE + TAC	–	Open trial	1.97
Skarphedinsson et al. (2015)	21	14.00	Individual	Direct	PE + ERP + RP	0.90	PE + TAC + EAT + CMT	0.30	RCT	1.86
Storch et al. (2006)	7	11.10	Individual	Direct	PE + ERP + CT + RP	7.00	PE + TAC + EAT + CMT	7.00	Open trial	3.15
Storch et al. (2010)	29	13.40	Individual	Direct	PE + ERP + CT + RP	7.00	PE + TAC + EAT + CMT	7.00	Open trial	3.05
Storch et al. (2011)	16	11.00	Individual	Internet	PE + ERP + CT + RP	1.46	PE + TAC + EAT + CMT	1.46	RCT	3.75
Storch et al. (2007)	18	14.50	Individual	Direct	PE + ERP + CT + RP	1.50	PE + TAC + EAT + CMT	1.50	RCT	1.94
Storch et al. (2007)	20	12.00	Individual	Direct	PE + ERP + CT + RP	7.00	PE + TAC + EAT + CMT	7.00	RCT	2.81
Torp et al. (2015)	241	12.80	Individual	Direct	PE + ERP + RP	1.25	PE + TAC + EAT	0.82	Open trial	2.58
Turner et al. (2009)	10	15.00	Individual	Telephone	PE + ERP + CT	–	PE + EAT	–	Open trial	2.08
Turner et al. (2014)	33	14.50	Individual	Direct	PE + ERP + CT	–	PE + EAT	0.30	RCT	3.01
Turner et al. (2014)	33	14.19	Individual	Telephone	PE + ERP + CT	–	PE + EAT	0.30	RCT	3.21
Waters et al. (2001)	7	11.63	Individual	Direct	PE + ERP + CT + RP	1.00	PE + TAC + EAT + PS	0.75	Open trial	3.78
Whiteside & Jacobsen (2010)	15	13.13	Individual	Direct	PE + ERP + CT	9.00	PE + EAT	9.00	Open trial	2.24
Whiteside et al. (2014)	22	12.59	Individual	Direct	PE + ERP + CT	9.00	PE + EAT	9.00	Open trial	1.58

N: sample size in the posttest for each group, PE: psychoeducation, ERP: exposure with response prevention, CT: cognitive training, RP: relapse prevention, MI: motivational interview, TAC: targeting accommodation, EAT: exposure assistance training, PS: problem solving, CMT: contingence management training, Treatment intensity (number of hours per week), *d*: effect size for CY-BOCS pre-postest outcome.

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