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The effectiveness of psychological treatments for obsessive-compulsive disorders: a meta-analysis of randomized controlled trials published over last 30 years

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Review Article

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Abstract

Background. Although numerous studies have examined the effects of psychological treatments for obsessive-compulsive disorder (OCD), their overall effectiveness remains unclear. We aimed to estimate their overall effect by combining all available randomized controlled trials (RCTs) comparing psychological treatments to control groups for OCD.

Methods. We conducted a meta-analysis of 48 RCTs with 55 comparisons published between 1992 and 1 January 2023. The primary outcome was OCD symptom severity, with Hedges' g calculated at post-treatment and follow-up. Random-effects models were employed for all analyses, and the risk of bias was assessed.

Results. In general, psychological treatments demonstrated a significantly large effect ($g = -1.14$; 95% CI [−1.31 to −0.97]; $I^2 = 72.23\%$) on reducing OCD symptom severity post-treatment, this finding remained consistent across measures and after excluding outliers, but lost significance in the sensitivity analysis for only studies with low risk of bias. Type of treatment, control group and treatment format were associated with treatment effects. Moreover, more severe baseline OCD symptom severity predicted higher degree of treatment efficacy. No significant differences were observed in dropout rates between the treatment and control groups. Treatment effects lost significance at 3–6 and 6–12 month follow-ups. 87% of RCTs were rated at high risk of bias.

Conclusions. Psychological treatments are effective in reducing OCD symptom severity. However, caution should be exercised when interpreting these results due to the high heterogeneity and risk of bias across RCTs. Future studies with more rigorous methodology are required, as well as studies examining their long-term effectiveness.

Introduction

Obsessive-compulsive disorder (OCD) is a chronic and debilitating mental disorder (Abramowitz & Jacoby, 2014), with a lifetime prevalence of 1–3% worldwide (Fawcett, Power, & Fawcett, 2020; Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012; Ruscio, Stein, Chiu, & Kessler, 2010; Subramaniam, Abdin, Vaingankar, & Chong, 2012), adversely affecting both individual patients and their families (Steketee, 1997; Stengler-Wenzke, Kroll, Matschinger, & Angermeyer, 2006).

Exposure and response prevention (ERP) is widely considered the gold standard psychological treatment for individuals with OCD and is often the core component of cognitive-behavioral therapy (CBT; Baruah et al., 2018; Fals-Stewart & Schafer, 1992; Mancebo, Yip, Boisseau, Rasmussen, & Zlotnick, 2021). Additionally, other psychological treatments have also shown effectiveness in reducing OCD symptom severity, including cognitive therapy (CT; Alcolado & Radomsky, 2016; van Balkom et al., 1998) and third-wave CBT, such as mindfulness-based cognitive therapy (MBCT; Zhang et al., 2021) and acceptance and commitment therapy (ACT; Schneider, Wittekind, Talhof, Korrelboom, & Moritz, 2015; Twohig et al., 2010).

Previous meta-analyses have examined the effectiveness of specific therapeutic approaches, such as CBT, ERP, and MBCT (Chien, Tse, Chan, Cheng, & Chen, 2022; Ferrando & Selai, 2021; Reid et al., 2021; Spencer et al., 2023). An early meta-analysis of 19 studies (Rosa-Alcázar, Sánchez-Meca, Gómez-Conesa, & Marín-Martínez, 2008) found similar effects of ERP, CT, and ERP + CT, compared to control groups. However, this meta-analysis synthesized evidence published from 1980 to 2006. The latest relevant meta-analysis (Öst, Havnen, Hansen, & Kvale, 2015) included 37 randomized controlled trials (RCTs) conducted between 1993 and 2014, and investigated the effectiveness of CBT (including CT, ERP, or CT + ERP) on

OCD symptom severity. Yet, this analysis compared active treatments with each other and with control groups, making interpretation particularly complex for head-to-head comparisons due to the small number of analyzed studies. Moreover, it solely relied on the clinician-rated Yale-Brown Obsessive-Compulsive Scale (Y-BOCS), overlooking other common measures of OCD symptom severity, such as self-rated Y-BOCS and Obsessive-Compulsive Inventory-Revised (OCI/OCI-R), and only included evidence on a limited range of treatment delivery formats, including individual, group, and family involved. Additionally, the common practice of including studies published in English in meta-analyses might result in missing potentially important studies published in non-English languages, which could significantly contribute to the existing knowledge base.

To address the previous limitations, we aimed to conduct a new meta-analysis. First, we conducted extensive searches to include up-to-date RCTs comparing psychological treatments to control groups; second, we considered all available psychological treatments and outcomes measuring OCD symptom severity; lastly, in addition to widely used international databases, we also included Chinese bibliographic databases, recognizing China being the second most populous country in Asia and the world, with a substantial number of individuals suffering from OCD ("中国强迫症防治指,南2016(精编版)," 2016). While many Chinese researchers have explored OCD (符泽娟 & 谢海玲, 2016; 耿艳萌, 许志鹏, & 吴长海, 2009; 胡思思, 2016), their work might not be accessible in international databases because of language barriers. By encompassing all relevant RCTs, we aimed to gain a comprehensive understanding of the overall effectiveness of psychological treatments for OCD relative to control groups. Drawing on existing knowledge (Öst et al., 2015; Rosa-Alcázar et al., 2008), we hypothesized that psychological treatments would significantly reduce OCD symptom severity compared to control groups.

Methods

Identification of studies

The protocol for the current meta-analysis has been preregistered on the Open Science Framework and is accessible at https://archive.org/details/osf-registrations-n3rxf-v1.

We conducted comprehensive searches in both international and Chinese databases from inception to 1 January 2023. International databases include PubMed, Embase, PsycINFO, and the International clinical trials registry platform of WHO (ICTRP). Chinese databases include CNKI, WanFang, WeiPu, and China Clinical Trial Registry (CCTR). The full search strings can be found in Appendix A. Moreover, we searched the reference lists of earlier meta-analyses on psychological treatments for OCD (Gava et al., 2007; Öst et al., 2015; Rosa-Alcázar et al., 2008).

All records were screened by two researchers independently. Full-text retrieval was performed for studies meeting potential inclusion criteria by either researcher. Decisions regarding study inclusion or exclusion were made jointly, with any disagreements resolved through discussion.

Selection of studies

Inclusion criteria:

- RCTs comparing psychological treatments to control groups
- Control groups include waitlist, care-as-usual (CAU), pill placebo, and psychological placebo
- Participants diagnosed with primary OCD, determined through valid semi-structured interviews, including different versions of the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases and Related Health Problems (ICD)
- Any outcome measuring OCD symptom severity
- Be published, or in press

We did not exclude participants diagnosed with OCD and comorbid psychiatric conditions to increase the generalizability of the effects. No restrictions on setting, gender or age were applied.

Exclusion criteria:

- Stepped care management, maintenance, and augmentation trials;
- Unguided self-help psychological treatments (Cuijpers & Schuurmans, 2007) where individuals work independently on the program/treatment protocol to learn and apply psychotherapeutic strategies.

Coding domains

Included RCTs were coded based on three categories:

- Study design: (a) type of psychological treatment (the definition of psychological treatment can be found in Appendix B); (b) type of control group.
- Effect size calculation: (a) outcome measure; (b) type of measurement (clinician-rated, self-rated); (c) assessment point (at baseline, post-treatment, follow-up); (d) treatment length; e) the analysed sample (completers or intention-to-treat); (f) mean, standard deviation, and number of participants in both groups.
- Moderators: (a) publication year; (b) region of study origin; (c) mean age; (d) age group (child: <13, adolescence: 13–18, adult: >18); (e) proportion of women; (f) recruitment methods of participants (clinical, community, other); (g) co-occurring disorder among participants (yes/no, defined as participants exhibiting at least one shared type of mental disorder); (h) proportion of participants using psychiatric medicine in both groups; (i) number of treatment sessions; (j) treatment delivery format, including individual, group, family-involved (involving the patient's family members in treatment sessions), guided self-help, and time-intensive (defined by a maximum total duration of 4 weeks, necessitating a minimum of 10 therapist hours overall, with an average weekly therapist commitment of at least 5 h; Jónsson, Kristensen, & Arendt, 2015).

Risk of bias

The risk of bias was assessed by the revised Cochrane risk-of-bias tool for randomized trials (ROB 2; Sterne et al., 2019), which comprises five domains: (1) bias arising from the randomization process; (2) bias due to deviations from intended interventions; (3) bias due to missing outcome data; (4) bias in the measurement of the outcome; and (5) bias in the selection of the reported result.

Coding and assessment of risk of bias were conducted by two independent researchers, and any disagreements were resolved through discussion.

Outcome measures

Our primary outcome was OCD symptom severity. Any outcomes measuring OCD symptom severity were included, such as the

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clinician/self-rated Y-BOCS (Goodman et al., 1989; Schaible, Armbrust, & Nutzinger, 2001), the Children's Y-BOCS (Scahill et al., 1997), OCI/OCI-R (Foa et al., 2002; Foa, Kozak, Salkovskis, Coles, & Amir, 1998), the Dimensional Obsessive-Compulsive Scale-Short Form (DOCS-SF; Abramowitz et al., 2010), the Vancouver Obsessional Compulsive Inventory (VOCI; Thordarson et al., 2004), and the National Institute of Mental Health Obsessive-Compulsive Scale/National Institute of Mental Health Global Obsessive Compulsive Scale (NIMH-OC/GOCS; Baer & Minichiello, 1990) etc.

Meta-analysis

We conducted meta-analysis using packages 'metapsytools', 'meta' (Schwarzer, 2007), 'metafor' (Viechtbauer, 2010), and 'dmetar' (Harrer, Cuijpers, Furukawa, & Ebert, 2021) in R version of 4.2.1 through R studio.

We calculated Hedges' g (Hedges & Olkin, 2014) for each study, considering small sample sizes. Mean, standard deviation, and the number of participants in treatment and control conditions at post-treatment and follow-up were used for effect size calculations. Effect sizes were calculated by subtracting the average score of the control group from the average score of the psychological treatment group, and dividing the result by the pooled standard deviation. If means and standard deviations were not reported, we converted dichotomous outcomes into effect sizes using the methods described by Borenstein, Hedges, Higgins, & Rothstein (2021). If dichotomous outcomes were not available either, we extracted change scores from baseline in both groups. If none of them were available, other statistics (such as t value or p value) were used to calculate the effect size. An effect size of 0.2, 0.5, and 0.8 was interpreted as small, moderate, and large, respectively (Cohen, 2013).

In our primary analysis for calculating the pooled effect size, we first aggregated all available effect size data for a comparison between psychological treatment and control group within a specific study. Then, we pooled these aggregated effects across comparisons before pooling across studies (Borenstein, Hedges, Higgins, & Rothstein, 2009).

To account for the expected heterogeneity among the studies, we used random-effects models in all analyses. Heterogeneity was assessed using the I^2 statistic (Ioannidis, Patsopoulos, & Evangelou, 2007) and its 95% confidence interval (CI), with values quantified as low (25%), moderate (50%), and high (75%) (Higgins, Thompson, Deeks, & Altman, 2003). Prediction intervals (PI) were included to represent the 95% CI of the predictive distribution of effects in future comparable trials.

Next to examining the funnel plot, we corrected our primary analyses by the presence of publication bias employing three methods: Duval and Tweedie's trim and fill procedure (Duval & Tweedie, 2000), Rücker's Limit Meta-Analysis (Rücker, Schwarzer, Carpenter, Binder, & Schumacher, 2011), and selection models (McShane, Böckenholt, & Hansen, 2016). Additionally, we conducted Egger's test of the intercept to quantify the bias captured by the funnel plot and to test whether it was significant (Egger, Smith, Schneider, & Minder, 1997).

Subgroup analyses were conducted for categorical variables to explore potential moderators of effect sizes, using a mixed-effects model. Within subgroups, effect sizes were pooled using the random-effects model, and differences between subgroups were tested using the fixed-effects model. Subgroup analyses required at least three studies per subgroup. Additionally, bivariate meta-regression analyses were performed for continuous variables (i.e. the proportion of female, and the proportion of participants using psychiatric medicine in the treatment group), using clinician-rated Y-BOCS as the main outcome, which is considered the gold standard for assessing OCD symptom severity (Goodman et al., 1989), to investigate potential predictors of effect sizes,

Sensitivity analyses were performed by: (a) excluding outliers (studies whose 95% CIs of effect sizes did not overlap with the 95% CI of the pooled effect size); (b) limiting analysis to only studies with low risk of bias (all domains were rated as *'low risk'* by RoB 2); (c) focusing on each specific instrument of OCD symptom severity reported across studies: (d) estimating the pooled effect size using a three-level correlated hierarchical effects (CHE) model (Cheung, 2014) with an assumed intra-study correlation of $\rho = 0.5$, and (e) calculating the effect considering the smallest or largest effect in each study.

Additionally, we calculated the relative risk (RR) of study dropout (any cause discontinuation) in the treatment groups compared with the control groups at post-treatment and pooled them using the Mantel–Haenszel method (Robins, Greenland, & Breslow, 1986).

Results

Search, selection, and inclusion of studies

Our search strategy identified a total of 11 235 records (3057 international, 8178 Chinese). After removing duplicates, 7752 records were screened based on titles and abstracts and 576 studies underwent full-text screening. Ultimately, 48 RCTs were included (47 international, 1 Chinese). The PRISMA flowchart describing the study search, selection, and inclusion process is presented in Fig. 1.

Characteristics of included studies

Key characteristics of the included studies are summarized in Table 1. The references of included studies are provided in online supplementary material. A total of 48 RCTs, comprising 55 comparisons between psychological treatments and control groups, involving 2731 patients with OCD, were included in the analysis. Among these comparisons, 38 focused on adults, 11 on children, and 6 on adolescents. Participants' mean age ranged from 6 to 43 years, with an average of 52% female participants. Three studies focused on OCD with co-occurring disorder, including substance abuse (Fals-Stewart & Schafer, 1992), autism spectrum disorder (Russell et al., 2013), and autistic symptoms (Wolters, de Haan, Hogendoorn, Boer, & Prins, 2016). Geographically, the majority of comparisons (20) were conducted in North America, followed by Europe (10), Australia (9), the United Kingdom (6), Iran (3), Brazil (2), China (2), Japan (2), and India (1).

Treatment types: 28 treatments used CBT, 17 used ERP, 4 used CT, 3 used third-wave CBT, and 3 used other psychological treatments (satiation therapy, attachment-based intervention, and mixed intervention consisting of detached mindfulness plus cognitive restructuring). The majority of studies (88%) utilized treatment manuals, 75% conducted fidelity checks, and 85% delivered treatments through professionals (see Appendix C for the detailed information).

Control groups: 29 comparisons used waitlists, 16 used psychological placebos, 7 used CAUs, and 3 used pill placebos.

Treatment formats: 26 treatments were delivered as individual face-to-face, 11 used family-involved, 6 used guided self-help, 4

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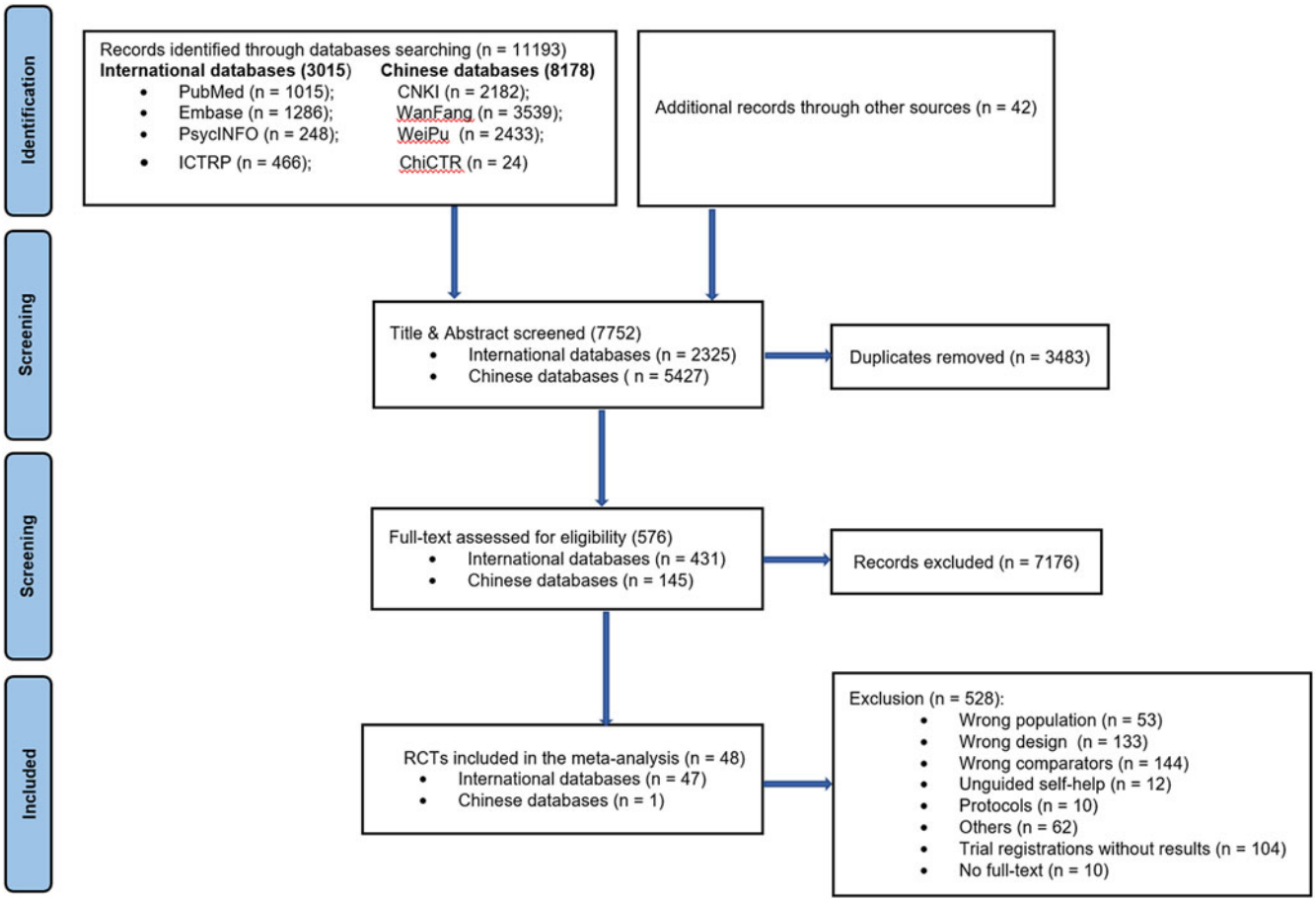

Figure 1. PRISMA flowchart on the study search, selection, and inclusion.

used group, 4 used time-intensive, and 4 used other treatment delivery formats, including mixed format of individual plus group (Mancebo et al., 2021), videoconference plus telephone (Vogel et al., 2014), and two unclear formats (Rezvan et al., 2013; 符泽娟 & 谢海玲, 2016).

Treatment sessions ranged from 2 to 26, with post-treatment assessments conducted between 3 and 26 weeks and follow-up assessments occurring at 12–58 weeks (approximately 3–13 months) after randomization. Outcome measurements varied across trials, with clinician-rated Y-BOCS (33) and CY-BOCS (16) being the most commonly used for OCD studies on adults and children/adolescent, respectively. Other measures included OCI/OCI-R (11), self-rated Y-BOCS (4), and NIMHOC/NIMHGOCS (7) etc.

Regarding risk of bias, only 53% reported adequate sequence generation, 40% had adequate concealed allocation, 76% employed blinded outcome assessors or self-report outcomes, and 33% used appropriate methods to handle missing data. Moreover, 84% of the RCTs were at risk of selective reporting, either not registered or registered retrospectively. In total, 87% of RCTs were rated as having a high risk of bias. The overall risk of bias assessment is presented in Fig. 2.

Effects of psychological treatments on OCD symptom severity

The combined effect size was $g = -1.14$ (95% CI [−1.31 to −0.97)) at post-treatment with high between-study heterogeneity ($I^2 = 72.23\%$; 95% CI [63.7–78.75); see Table 2). The prediction interval ranged from −2.20 to −0.08. However, the effects lost significance at 3–6 month ($g = -1.45$; 95% CI [−3.06 to 0.16]; $n = 6$) and 6 −12 month follow-ups ($g = -1.32$; 95% CI [−3.38 to 0.73]; $n = 5$). The forest plot is presented in Fig. 3.

There were some indications for publication bias, as suggested by the funnel plot and the Egger's test of the intercept (intercept = −2.57; 95% CI [−0.37 to 0.24]; $p = 0.002$; see Appendix D). After adjustment for publication bias using Duval and Tweedie's trim-and-fill procedure, which identified 13 missing studies, the effect size remained large and significant ($g = -0.88$; 95% CI [to 1.09 to −0.67]). The selection model yielded similar results as the trim-and-fill procedure, and the limit meta-analysis revealed smaller but still significant moderate effect size ($g = -0.59$; 95% CI [−0.93 to −0.24]; see Table 2).

Sensitivity analyses

After removing 11 outliers, the effect size remained comparable to the overall effect size ($g = -1.08$; 95% CI [−1.2 to −0.97]), and between-study heterogeneity decreased considerably ($I^2 = 33.35\%$; 95% CI [3.35–54.04]). Furthermore, sensitivity analyses for specific instruments showed consistent and robust findings, such as clinician-rated Y-BOCS ($g = -1.11$; 95% CI [−1.33 to −0.88]; $n = 33$), CY-BOCS ($g = -1.26$; 95% CI [−1.65 to −0.87]; $n = 16$), OCI/OCI-R ($g = -0.99$; 95% CI [−1.31 to −0.67]; $n = 11$), and NIMHOC/NIMHGOCS ($g = -2.07$; 95% CI [−2.79 to −1.34];

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Table 1. Key characteristics of included studies

Study	Psy	Ctr	Fmt	Nsess	Pos	FU1	FU2	FU3	Outcome	N_Psy	N_Ctr	D_Psy	D_Ctr	M age	Age g	% Wom	Region	Recru	Comd	% Med_P	% Med_C	SG	AC	IOD	BA	SOR
Alcolado et al. (2016)	CT	WL	ind	2	3	–	–	–	VOCI	12	12	–	–	33	Adult	71	North A	Com	N	–	–	–	–	–	sr	–
Anderson et al. (2007a)	CBT	WL	grp	9	10	–	–	–	Y-BOCS	20	14	5	3	35	Adult	74	Aus	Clin	N	65	57	–	–	–	–	–
Anderson et al. (2007b)	CBT	WL	ind	10	10	–	–	–	Y-BOCS	17	14	4	3	33	Adult	66	Aus	Clin	N	65	57	–	–	–	–	–
Andersson et al. (2012)	CBT	Psyp	gsh	7	10	–	–	–	Y-BOCS; OCI-R	49	51	2	0	34	Adult	66	EU	Com	N	20	25	+	+	+	+	–
Barrett et al. (2003)	CBT	WL	FI	14	14	–	–	–	CY-BOCS; NIMHGOCS	12	12	–	–	11	Child	42	Aus	Com	N	–	–	–	–	–	–	–
Barrett et al. (2004a)	CBT	WL	FI	14	14	–	–	–	CY-BOCS; NIMHGOCS	22	24	–	–	11	Child	48	Aus	Com	N	13	21	–	–	+	+	–
Barrett et al. (2004b)	CBT	WL	FI	14	14	–	–	–	CY-BOCS; NIMHGOCS	29	24	–	–	12	Child	51	Aus	Com	N	31	21	–	–	+	+	–
Bolton et al. (2008)	ERP	WL	ind	9	7	–	–	–	CY-BOCS	10	10	2	0	13	Adol	30	UK	Clin	N	0	0	+	+	–	–	–
Bolton et al. (2011a)	CBT	WL	ind	12	12	––	–	–	CY-BOCS; OCI	36	24	2	3	15	Adol	56	UK	Clin	N	11	21	–	+	–	+	–
Bolton et al. (2011b)	CBT	WL	ind	5	12	–	–	–	CY-BOCS; OCI	36	24	2	3	14	Adol	60	UK	Clin	N	6	21	–	+	–	+	–
Braga et al. (2016)	CBT	WL	grp	12	12	–	–	–	Y-BOCS	61	42	14	33	43	Adult	67	EU	Com	N	53	41	–	–	–	–	–
Challacombe et al. (2017)	CBT	CAU	TI	4	26	–	–	–	Y-BOCS; OCI-R	17	16	0	1	33	Adult	100	UK	Com	N	41	64	+	+	+	+	–
Cordioli et al. (2003)	CBT	WL	grp	12	12	–	–	–	Y-BOCS; NIMHOC	23	24	1	1	37	Adult	51	Brazil	Com	N	43	46	+	+	+	+	–
Fals-Stewart et al. (1992)	ERP	Psyp	ind	18	6	58	–	–	NIMHOC	19	18	1	2	33	Adult	26	North A	Oth	Y	–	–	–	–	–	–	–
Foa et al. (2005)	ERP	Pillp	TI	15	12	–	–	–	Y-BOCS; NIMHOC	21	20	16	12	34	Adult	51	North A	Com	N	–	–	–	–	–	+	–
Freeman et al. (2014)	CBT	Psyp	FI	12	14	–	–	–	CY-BOCS	63	64	2	6	7	Child	53	North A	Com	N	95	6	+	–	–	+	+
Freeman et al. (2008)	CBT	Psyp	FI	12	14	–	–	–	CY-BOCS	22	20	1	1	7	Child	57	North A	Com	N	–	–	–	–	+	+	–
Freeston et al. (1997)	CBT	WL	ind	26	16	–	–	–	Y-BOCS; PAUDA	15	14	–	–	36	Adult	45	North A	Oth	N	33	36	–	–	–	–	–
Gomes et al. (2016)	CBT	WL	FI	12	13	–	–	–	Y-BOCS; OCI-R	46	39	6	7	41	Adult	62	Brazil	Com	N	50	59	+	+	–	–	–

(*Continued*)

Table 1. (*Continued.*)

Study	Psy	Ctr	Fmt	Nsess	Pos	FU1	FU2	FU3	Outcome	N_Psy	N_Ctr	D_Psy	D_Ctr	M age	Age g	% Wom	Region	Recru	Comd	% Med_P	% Med_C	SG	AC	IOD	BA	SOR
Greist et al. (2002)	ERP	Psy p	ind	11	10	–	–	–	Y-BOCS (sr)	55	66	14	9	39	Adult	42	North A	Com	N	–	–	–	–	–	+	–
Herbst et al. (2014)	ERP	WL	gsh	14	8	–	–	–	Y-BOCS (sr); OCI-R	16	18	0	3	36	Adult	65	EU	Com	N	26	26	–	–	–	+	–
Khodarahimi et al. (2009a)	ERP	WL	ind	12	6	13	26	–	Y-BOCS (sr)	20	20	–	–	25	Adult	0	Iran	Com	N	0	0	–	–	–	+	–
Khodarahimi et al. (2009b)	Other	WL	ind	12	6	13	26	–	Y-BOCS (sr)	20	20	–	–	25	Adult	0	Iran	Com	N	0	0	–	–	–	+	–
Kobayashi et al. (2020)	ERP	CAU	FI	24	16	–	–	–	Y-BOCS	9	8	1	1	30	Adult	47	Japan	Clin	N	89	88	+	+	–	+	+
Kyrios et al. (2018)	CBT	Psy p	gsh	12	12	–	–	–	Y-BOCS	89	90	37	27	33	Adult	66	Aus	Com	N	71	75	+	+	–	+	–
Lenhard et al. (2017)	CBT	WL	FI	12	12	–	–	–	CY-BOCS; CHOCI-R-C; CHOCI-R-P	33	34	0	1	15	Adol	46	EU	Com	N	28	18	+	+	+	+	+
Lewin et al. (2014)	ERP	CAU	FI	12	7	–	–	–	CY-BOCS	17	14	0	0	6	Child	29	North A	Clin	N	6	43	–	–	+	+	–
Lindsay et al. (1997)	ERP	Psy p	TI	15	3	–	–	–	Y-BOCS; MOCI; PADUA	9	9	0	0	33	Adult	67	Aus	Clin	N	28	28	–	–	+	–	–
Launes et al. (2019)	ERP	WL	TI	-	12	–	–	–	Y-BOCS; OCI-R; DOCS-SF	16	15	0	1	32	Adult	78	EU	Clin	N	25	25	+	+	+	+	+
Mancebo et al. (2021)	ERP	CAU	oth	22	16	29	42	–	Y-BOCS	25	14	8	4	38	Adult	74	North A	Clin	N	79	67	+	–	–	+	–
Mathur et al. (2021)	3 rd	Psy p	ind	12	12	–	–	–	Y-BOCS	30	30	1	2	28	Adult	33	India	Clin	N	70	83	+	+	+	+	+
Matsumoto (2022)	CBT	WL	gsh	12	12	–	–	–	Y-BOCS; OCI	14	16	1	0	30	Adult	57	Japan	Com	N	–	–	+	+	+	+	+
Norman et al. (2021)	ERP	Psy p	ind	12	12	–	–	–	Y-BOCS	42	45	0	2	24	Adult	66	North A	Com	N	48	42	+	–	+	+	+
O'Connor et al. (1999)	CBT	CAU	ind	20	20	–	–	–	Y-BOCS; NIMHOC	6	6	–	–	37	Adult	42	North A	Clin	N	–	–	–	–	–	+	–
O'Connor et al. (2006)	CBT	Pill p	ind	20	22	–	–	–	Y-BOCS; PADUA	10	10	–	–	37	Adult	70	North A	Com	N	0	0	+	+	–	+	–
Piacentini et al. (2011)	CBT	Psy p	FI	12	14	–	–	–	CY-BOCS	40	17	9	5	12	Child	63	N America	Com	N	0	0	+	–	–	+	+
Rezvan et al. (2013)	Other	CAU	oth	8	8	12	–	–	CY-BOCS	12	12	0	0	10	Child	100	Iran	Clin	N	0	0	–	–	+	–	–
Rupp et al. (2019)	Other	WL	ind	4	2		–	–	Y-BOCS	20	20	2	1	31	Adult	58	EU	Com	N	36	52	+	+	–	+	–

Russell et al. (2013)	ERP	Psy p	ind	17	27	31	–	–	Y-BOCS; OCI-R; D-YBOCS	20	20	3	3	27	Adult	24	UK	Oth	Y	–	–	+	+	–	+	–
Russman et al. (2023a)	ERP	Psy p	ind	12	12	–	–	–	Y-BOCS	27	27	–	–	16	Adol	67	North A	Com	N	67	56	+	–	–	+	–
Russman et al. (2023b)	ERP	Psy p	ind	12	12	–	–	–	Y-BOCS	31	31	–	–	32	Adult	52	North A	Com	N	45	42	+	–	–	+	–
Storch et al. (2011)	CBT	WL	FI	14	12	–	–	–	CY-BOCS	16	15	2	0	11	Child	39	North A	Com	N	56	53	+	+	–	+	–
POST et al. (2004)	CBT	Pill p	ind	14	12	–	–	–	CY-BOCS	28	28	3	7	12	Child	50	North A	Com	N	–	–	+	–	–	+	–
Twohig et al. (2010)	3 rd	Psy p	ind	8	9	22	–	–	Y-BOCS	36	33	0	0	37	Adult	66	North A	Com	N	34	44	+	+	–	+	–
Van et al. (1998a)	CT	WL	ind	6	8	–	–	–	Y-BOCS; PADUA	25	16	0	2	35	Adult	63	EU	Com	–	16	6	–	–	+	+	–
Van et al. (1998b)	ERP	WL	ind	6	8	–	–	–	Y-BOCS; PADUA	20	16	2	2	35	Adult	54	EU	Com	–	16	6	–	–	+	+	–
Vogel et al. (2014)	ERP	WL	oth	12	12	–	–	–	Y-BOCS; VOCI	10	10	0	2	35	Adult	55	EU	Clin	N	–	–	–	–	–	+	–
Whittal et al. (2010)	CT	Psy p	ind	12	12	26	52	–	Y-BOCS	37	30	0	0	32	Adult	46	North A	Com	N	52	52	–	–	+	+	–
Wilhelm et al. (2009)	CT	WL	ind	12	12	–	–	–	Y-BOCS	–	–	3	2	33	Adult	52	North A	Com	N	48	48	–	–	–	+	–
Williams et al. (2010)	CBT	WL	ind	10	12	–	–	–	CY-BOCS; OCI-R	11	10	1	1	14	Adol	38	UK	Clin	N	33	33	+	+	–	+	–
Wootton et al. (2013a)	CBT	WL	gsh	4	8	–	–	–	Y-BOCS; DOCS	20	17	5	5	37	Adult	68	Aus	Com	N	50	1	+	+	–	–	–
Wootton et al. (2013b)	CBT	WL	gsh	4	8	–	–	–	Y-BOCS; DOCS	15	17	6	5	39	Adult	78	Aus	Com	N	60	1	+	+	–	–	–
Wolters et al. (2016)	CBT	WL	ind	8	8	–	–	–	CY-BOCS	19	22	1	2	12	Child	61	EU	Clin	Y	0	0	+	–	–	+	–
Zhang et al. (2021)	3 rd	Psy p	grp	11	10	14	22	34	Y-BOCS	28	29	14	11	29	Adult	32	China	Clin	N	0	0	+	+	–	+	+
Zejuan-Fu et al. (2016)	CBT	CAU	oth	–	–	–	–	–	Y-BOCS	50	50	0	0	33	Adult	55	China	Clin	N	56	54	+	–	+	–	–

Psy, type of psychological treatment; CBT, cognitive-behavioral therapy; CT, cognitive therapy; ERP, exposure and response prevention; 3rd, third-wave cognitive-behavioral therapy; other, other psychological treatment; Ctr, control group; WL, waitlist; CAU, care-as-usual; Psy p, psychological placebo; pill p, pill placebo; Fmt, treatment format; ind, individual; grp, group; FI, family-involved; gsh, guided self-help; TI, time-intensive; other, other/mixed format/not clear; Nsess, number of treatment sessions at post-treatment; Pos, assessment point at post-treatment; FU, assessment point at follow-up; Outcome, outcome measures; Y-BOCS, the Yale-Brown Obsessive-Compulsive Scale; CY-BOCS, the Children's Yale-Brown Obsessive Compulsive Scale; OCI (-R), the Obsessive Compulsive Inventory (-Revised); NIMH-OC, the National Institute of Mental Health Obsessive-Compulsive Scale; NIMH-GOCS, the National Institute of Mental Health Global Obsessive Compulsive Scale; PADUA, the Padua Inventory; DOCS (-SF), the Dimensional Obsessive-Compulsive Scale (- Short form); VOCI, the Vancouver Obsessional Compulsive Inventory; D-YBOCS, the Dimensional-Yale Brown Obsessive-Compulsive Scale; MOCI, the Maudsley Obsessional-Compulsive Inventor; CHOCI-R-C/P, the Children's Obsessional Compulsive Inventory–Revised – children reported/patients reported); N_Psy, number of participants in treatment condition at post-treatment; N_Ctr, number of participants in control condition at post-treatment; D_Psy, number of dropouts in treatment condition at post-treatment; D_Ctr, number of dropouts in control condition at post-treatment. M age, mean age; Age g, age group (child; adol, adolescent; adult); % Women, the proportion of women; Region, region of the trial (North A, North America; Aus, Australia; EU, Europe; UK, United Kingdom; Brazil; Iran; Japan; China; India); Recur, methods of recruiting participants (com, community; clin, clinical setting; other); Comd, co-occurring mental disorder (yes/no); % Med_P, proportion of participants using psychiatric medicine in treatment condition; % Med_C, proportion of participants using psychiatric medicine in control condition; SG, sequence generation (positive or negative [negative includes unclear]); AC, allocation concealment (positive or negative [negative includes unclear]); BA, blinded assessment (positive or negative [negative includes unclear]; sr, self-report); IOD, incomplete outcome data (positive or negative [negative includes unclear]); SOR, selective outcome reporting (positive or negative [negative includes unclear]).

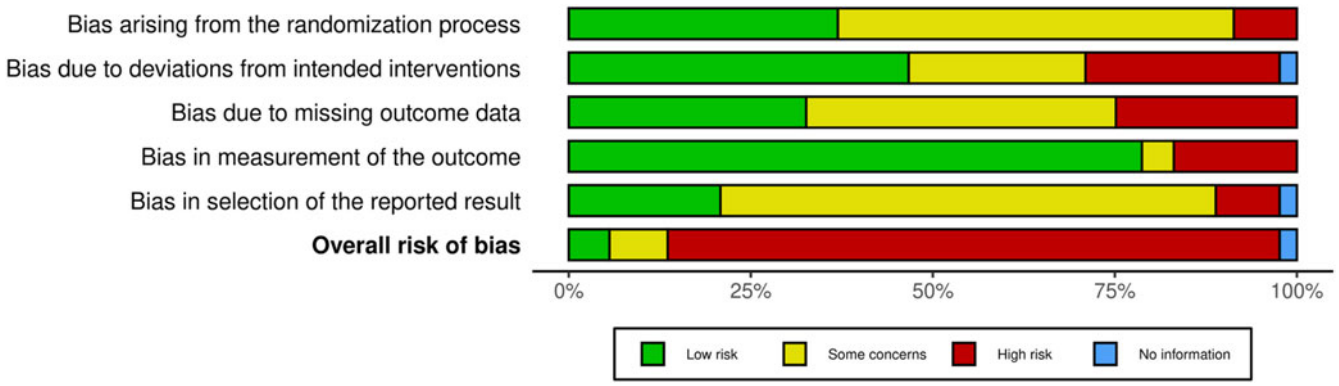

Figure 2. The overall assessment of risk of bias by RoB 2.

Table 2. The effectivenss of psychological treatment for obsessive-compulsive disorder: Hedges'g[a]

	K	Hedges'g	95% CI	I^2	95% CI	PI	*p*
At post-treatment							
Combined	55	−1.14	−1.31 to −0.97)	72.23	(63.7–78.75)	(−2.2 to −0.08)	<0.001
Adjusted for publication bias							
Trim-and-fill method (add 13)	68	−0.88	(−1.09 to −0.67)	81.91	(77.6–85.39)	(−2.44 to 0.68)	<0.001
Limit meta-analysis	55	−0.59	(−0.93 to −0.24)	80.94	–	(−1.69 to 0.52)	<0.001
Selection model	55	−0.84	(−1.24 to −0.44)	83.39	(70.99–91.55)	(−2.21 to 0.52)	<0.001
Sensitivity analyses							
Three-level model (CHE)	84	−1.13	(−1.31 to −0.96)	74.1	–	(−2.24 to −0.03)	<0.001
One ES/study (lowest)	50	−1.17	(−1.37 to −0.97)	71.6	(62.32–78.59)	(−2.29 to −0.05)	<0.001
One ES/study (highest)	50	−1.04	(−1.2 to −0.88)	64.26	(51.74–73.54)	(−1.92 to −0.16)	<0.001
Outlier removed[b]	44	−1.08	(−1.2 to −0.97)	33.35	(3.35–54.04)	(−1.54 to −0.62)	<0.001
Study at low risk of bias	3	−0.87	(−2.25 to 0.5)	66.66	(0–90.38)	(−7.67 to 5.92)	0.11
Clinician-rated Y-BOCS	33	−1.11	(−1.33 to −0.88)	67.41	(53.22–77.3)	(−2.04 to −0.17)	<0.001
CY-BOCS	16	−1.26	(−1.65 to −0.87)	74.76	(58.84–84.52)	(−2.64 to 0.12)	<0.001
OCI (-R)	11	−0.99	(−1.31 to −0.67)	52.27	(5.25–75.95)	(−1.81 to −0.16)	<0.001
NIMH-OC/GOCS	7	−2.07	(−2.79 to −1.34)	68.44	(30.24–85.72)	(−3.82 to −0.31)	<0.001
PADUA	5	−0.68	(−1.27 to −0.09)	28.31	(0–71.96)	(−1.7 to 0.35)	0.03
Self-rated Y-BOCS	4	−1.88	(−3.8 to 0.04)	90.15	(77.74–95.64)	(−7.44 to 3.68)	0.05
DOCS (−SF)	3	−0.98	(−2.65 to 0.68)	65.23	(0–90.01)	(−9.29 to 7.32)	0.13
At follow-up							
3–6 months	6	−1.45	(−3.06 to 0.16)	94.65	(90.84–96.88)	(−5.93 to 3.04)	0.07
6–12 months	5	−1.32	(−3.38 to 0.73)	93.94	(88.72–96.74)	(−6.94 to 4.29)	0.15
Subgroup analyses							
Treatment							0.01
• CBT	28	−1.13	(−1.37 to −0.9)	73.1	(60.9–81.5)	–	
• ERP	17	−1.25	(−1.56 to −0.94)	64.4	(40.2–78.8)	–	
• CT	4	−0.96	(−2.16 to 0.24)	73.6	(26–90.6)	–	
• Third-wave	3	−0.55	(−1.22 to 0.12)	7.3	(0–90.4)	–	
Control group							
• Waitlist	29	−1.29	(−1.57 to −1.01)	75.5	(64.9–82.9)	–	0.014
• Psychological placebo	16	−0.82	(−1.06 to −0.59)	62.2	(35.1–78)	–	

(*Continued*)

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Table 2. (*Continued.*)

	K	Hedges'g	95% CI	I^2	95% CI	PI	*p*
• CAU	7	−1.27	(−1.68 to −0.87)	34.3	(0–72.2)	–	
• Pill placebo	3	−1.32	(−2.22 to −0.42)	22.9	(0–92)	–	
Format							0.003
• Individual	26	−1.09	(−1.34 to −0.83)	67.9	(51.9–78.6)	–	
• Group	4	−0.87	(−1.6 to −0.14)	66.9	(3.3–88.7)	–	
• Guided self-help	6	−0.81	(−0.98 to −0.65)	0.0	(0–74.6)	–	
• Family-involved	11	−1.39	(−1.99 to −0.8)	85.2	(75.2–91.2)	–	
• Time-intensive	4	−1.41	(−1.98 to −0.84)	5.1	(0–85.5)	–	
Age group							0.479
• Adult	38	−1.10	(−1.3 to −0.91)	68.1	(55.4–77.2)	–	
• child	11	−1.36	(−1.95 to −0.77)	83.8	(72.5–90.4)	–	
• Adolescent	6	−0.99	(−1.39 to −0.58)	49.4	(0–79.9)	–	
Comorbidity							0.253
• No	50	−1.19	(−1.37 to −1.01)	72.4	(63.4–79.1)	–	
• Yes	3	−0.80	(−2.22 to 0.62)	68.1	(0–90.7)	–	
Way to handle missing data							0.253
• Completer	27	−1.17	(−1.48 to −0.87)	80.5	(72.4–86.2)	–	
• Intention-to-treat	23	−1.02	(−1.2 to −0.83)	45.7	(11.4–66.7)	–	
Recruitment							
• Community	34	−1.17	(−1.42 to −0.92)	77.5	(69–83.7)	–	
• Clinical setting	18	−1.13	(−1.37 to −0.88)	55.7	(24.9–73.9)	–	
• Other	3	−0.87	(−2.32 to 0.59)	70.3	(0–91.3)	–	
Region							0.296
• North America	20	−1.07	(−1.27 to −0.86)	46.0	(8.8–68)	–	
• Australia	9	−1.45	(−2.14 to −0.75)	87.6	(78.5–92.8)	–	
• Europe	10	−0.90	(−1.22 to −0.58)	44.0	(0–73.1)	–	
• United Kingdom	6	−0.93	(−1.44 to −0.43)	63.5	(11.7–84.9)	–	
• Other	10	−1.41	(−2.03 to −0.79)	83.3	(70.7–90.5)	–	

K, number of comparisons; CI, confidence interval; PI, predication interval; ERP: exposure and response; CBT: cognitive-behavioral therapy; third-wave: third-wave cognitive-behavioral therapy; Y-BOCS, the Yale-Brown Obsessive-Compulsive Scale; CY-BOCS, the Children's Yale-Brown Obsessive Compulsive Scale; OCI (-R): the Obsessive Compulsive Inventory (-Revised); NIMH-OC, the National Institute of Mental Health Obsessive-Compulsive Scale; NIMH-GOCS, the National Institute of Mental Health Global Obsessive Compulsive Scale; PADUA, the Padua Inventory; DOCS (-SF), the Dimensional Obsessive-Compulsive Scale (-Short form); VOCI, the Vancouver Obsessional Compulsive Inventory; D-YBOCS, the Dimensional- Yale Brown Obsessive-Compulsive Scale; MOCI, the Maudsley Obsessional-Compulsive Inventor CHOCI-R-C/P, the Children's Obsessional Compulsive Inventory–Revised – children reported/patients reported.

[a]According to a random-effects model.

[b]Barrett (2003); Barrett (2004) cbft(ind); Barrett (2004) cbft(grp); Freeman (2008); Khodarahimi (2009) erp; Khodarahimi (2009) other psy; Kyrios (2018); Russell (2013); van-Balkom (1998)-CT; Whittal (2010); Zhang (2021).

The *p* values indicate whether the difference between the effect sizes in the subgroups is significant.

$n = 7$). However, the sensitivity analyses for self-rated Y-BOCS ($g = -1.88$; 95% CI [−3.8 to 0.04]; $n = 4$) and DOCS/DOCS-SF ($g = -0.98$, 95% CI [−2.65 to 0.68]; $n = 3$) did not show significant findings. Moreover, when limiting the analysis to only studies with low risk of bias ($n = 3$), the finding lost significance ($g = -0.87$; 95% CI [−2.25 to 0.5]; see Table 2).

Subgroup analyses

No significant differences in effect sizes were found based on age group, recruitment methods of participants, presence of comorbidity, handling of missing data, or the region of study origin. However, significant differences were observed for treatment type, control group type, and treatment delivery format. Specifically, ERP resulted in the largest effect size ($g = -1.25$, 95% CI [−1.56 to −0.94]), followed by CBT, which had a slightly smaller, but still comparable effect ($g = -1.13$, 95% CI [−1.37 to −0.9]) to ERP. The effects of CT and third-wave CBT were not significant. Psychological placebo resulted in the smallest effect ($g = -0.82$, 95% CI [−1.06 to −0.59]), while pill placebo resulted in the largest effect ($g = -1.32$, 95% CI [−2.22 to −0.42]) and waitlist ($g = -1.29$) and CAU ($g = -1.27$) had comparable effects to pill placebo. All treatment formats had significant large effects in treating OCD, with time-intensive ($g = -1.41$, 95% CI [−1.98

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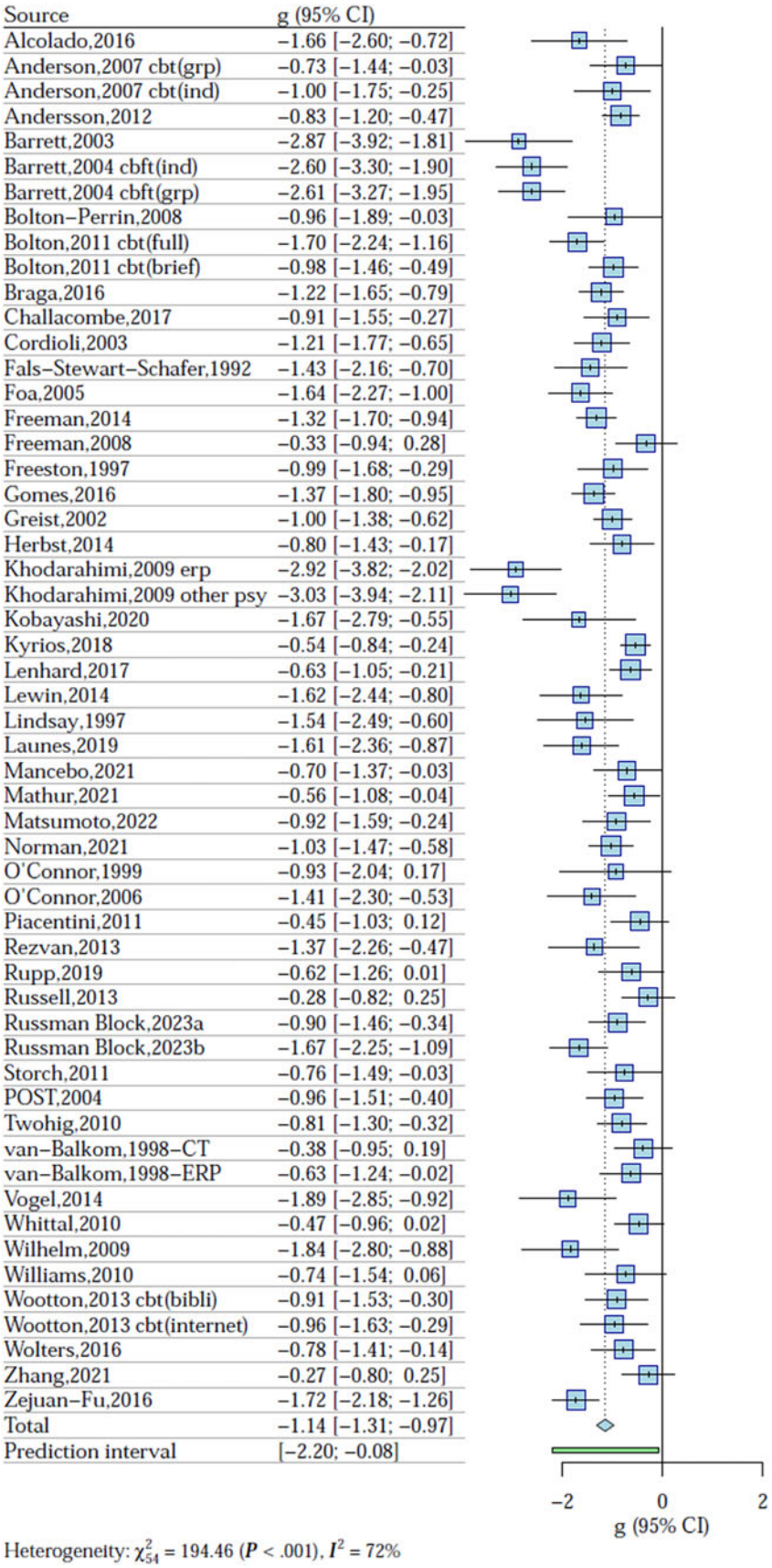

Figure 3. Forest plot of psychological treatments *v.* control conditions: Hedges' g.

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to −0.84]) and family-involved ($g = -1.39$, 95% CI [−1.99 to −0.8]) treatments exhibited comparable larger effects than the remaining formats (see Table 2). We excluded the categories of 'other psychological treatments' and 'other treatment delivery formats' from subgroup analyses, because studies in both categories involved totally different type of treatments or formats, compromising the representativeness of the findings.

Bivariate meta-regression analyses

No significant associations were found for mean age, proportion of women, proportion of participants using psychiatric medicine in the treatment group, and number of treatment sessions. However, a significant negative association was observed between baseline OCD symptom severity and effect size ($\beta = -0.1$, $p = 0.02$; see Appendix E).

Dropout

Study dropout rates in 59 comparisons between psychological treatments and control groups were calculated, revealing no indication of a differential pooled dropout rate (RR = 0.92; 95% CI [0.77–1.09]; $p = 0.31$).

Discussion

Synthesizing the largest number of RCTs to date, we provided a relatively comprehensive understanding of the overall effectiveness of psychological treatments for OCD. Compared to control groups, psychological treatments significantly reduced OCD symptom severity at post-treatment, and the effect persisted after a series of sensitivity analyses, including adjustment for publication bias.

We found that the type of treatment, control group, treatment format, and baseline OCD symptom severity may influence the treatment effects. Specifically, ERP showed the largest effect size, supporting its gold-standard status in OCD treatment. CBT received the most research attention and demonstrated a comparable effect size to ERP, indicating its widespread use and effectiveness. However, CT and third-wave CBT had smaller and non-significant effects, not confirming the previous studies. One previous meta-analysis (Rosa-Alcázar et al., 2008) found similar effects of ERP, CT, and ERP + CT based on studies published between 1980 and 2006, and another one (Başkaya, Özgüç, & Tanrıverdi, 2021) demonstrated a small but significant effect of MBCT on OCD symptom severity according to five studies containing non-RCTs. Although our meta-analysis contained a larger number of RCTs and provided the most up-to-date and comprehensive evaluation of psychological treatments for OCD, the effects of CT and third-wave CBT in present study should be interpreted cautiously due to the small number of studies with small simple sizes synthesized. Additionally, it may also suggest that the effect of CBT mainly arises from ERP, with CT playing a lesser role in OCD treatment, which is in line with previous research (Olatunji et al., 2013). Concerning control groups, psychological placebo yielded the smallest effect size, consistent with findings in a depression meta-analysis (Cuijpers, Quero, Papola, Cristea, & Karyotaki, 2021). The majority of studies used waitlist as a control group, which is associated with an overestimation of treatment effect (Michopoulos et al., 2021). Although effect sizes estimated with CAU and pill placebo comparators were similar to waitlist, the number of studies using such control conditions was very small and their results were probably uncertain. Regarding treatment format, individual treatment received most research attention and exhibited a large effect, showing its extensive use and effectiveness. Although group and guided self-help exhibited smaller effects than individual, time-intensive, and family-involved treatments, their effects could still be considered large, and they holds great advantages for facilitating implementation. While the association between time-intensive and larger effects aligns with prior research (Jónsson et al., 2015), caution is advised due to the limited number of RCTs supporting this conclusion. Additionally, previous meta-analyses have yielded mixed results on the effectiveness of family-involved treatment. One previous meta-analysis (Öst, Riise, Wergeland, Hansen, & Kvale, 2016) showed that family-involved CBT was not significantly better than individual CBT based on two head-to-head comparisons. On the other hand, other previous meta-analytic studies (Iniesta-Sepúlveda, Rosa-Alcázar, Sánchez-Meca, Parada-Navas, & Rosa-Alcázar, 2017; McGrath & Abbott, 2019) including both RCTs and non-RCTs showed large effects of family-involved CBT based on pre–post effect sizes. While the effect of the family-involved treatment needs further confirmation with more studies, our current findings highlight the potential importance of family function in OCD treatment. Moreover, we observed that more severe baseline OCD symptomatology predicted higher degree of change in the treatment, consistent with a previous study (Andersson et al., 2015). Future investigations should further explore the relationship between baseline OCD symptomology and treatment effect, ideally by exploring data at the patient level.

We encountered some discrepancies in the exploration of the long-term effects of psychological treatments for OCD, compared to previous related meta-analyses. First, previous meta-analyses on adults (Öst et al., 2015) and children/adolescents (Öst et al., 2016) with OCD reported mean follow-up periods of 15 months and 9 months, respectively. In contrast, our meta-analysis did not find similar follow-up periods. This discrepancy could be attributed to the nature of the comparisons included in our study. In our meta-analysis, we focused on the comparisons between psychological treatments and control groups, with most control groups involving waitlists, whose follow-up data, if available, is often not usable due to participants receiving the experimental intervention after the post-test. In contrast, the previous meta-analyses included both control and active treatment groups, which may potentially extend the overall follow-up periods. Additionally, we did not find significant effect sizes at 3–6 month and 6–12 month follow-up intervals, possibly due to the limited number of included trials. Future studies investigating the long-term effects of psychological treatments for OCD are necessary to provide more robust evidence in this area.

Recognizing the diversity in the assessment of OCD symptoms across studies as a reflection of real-world clinical variations, we aimed to comprehensively evaluate the overall effectiveness of psychological treatments for OCD by combining all available outcomes measuring OCD symptoms. Despite the variability, our findings indicated that, compared to control groups, psychological treatments were consistently effective across most outcome measures, with the exception of self-rated Y-BOCS and DOCS (-SF), where the non-significant results may have been influenced by the limited sample sizes. However, it is crucial to acknowledge that large between-study heterogeneity and high risk of bias observed across included RCTs introduced uncertainty and reduced the validity of the results. When the analysis was

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restricted to the studies with low risk of bias, the effect lost its statistical significance. Although the result was based on only three studies with low risk of bias, it adds uncertainty to the overall effect size, as these studies had more rigorous methodological designs and may better reflect the true effect estimate. Therefore, caution is necessary when interpreting the results from our meta-analysis. To strengthen the evidence base, conducting well-designed RCTs with appropriate randomization procedures, strict allocation concealment, and comprehensive reporting of outcomes are needed. What's more, this meta-analysis only included the outcomes measuring OCD symptom severity. Future studies should also consider other secondary outcomes, such as the quality of life, as a reduction in OCD symptom severity may not necessarily correlate with an overall improvement in the quality of life for individuals with OCD.

This study holds significant implications for advancing both clinical research and the treatment of OCD. First and foremost, it underscores the overall effectiveness of psychological treatments for OCD. However, the presence of high risk of bias across studies highlights the critical need for standardization in study design and methodology. The call for pre-registration of trials becomes imperative to mitigate publication bias and selective reporting in future studies. Additionally, there is a clear demand for more long-term evidence on the effectiveness of psychological treatments for OCD.

Second, the high between-study heterogeneity indicates varying treatment effects across studies. While subgroup analyses provide some insights into potential causes of differences, further research is necessary to identify potential moderators and predictors. Particularly, the direct comparison between ERP and CT is highly recommended, to further verify the effect of CT in treating OCD and its function in the CBT treatment containing both ERP and CT. Trials of head-to-head comparisons between different formats and studies investigating the effectiveness and acceptability of different formats are also needed, to further explore the most effective treatment format for OCD generally and which format is most beneficial to which population group.

Lastly, the study highlights the need for more rigorous research on psychological treatments for OCD in the Chinese context. Despite the initial identification of numerous Chinese studies on OCD, only one RCT was included, shedding light on existing research gaps. Pure pharmacotherapy was the predominant reason for the exclusion of Chinese studies in the full-text screening. Furthermore, the comparison between psychological nursing plus traditional nursing to traditional nursing was the main focus of Chinese studies in the field of psychological treatment for OCD, incompatible of our conceptualizations of treatment and control groups in present study. Non-RCT designs in numerous studies also played a pivotal role in their exclusion. Future research on psychological treatments with more rigorous methodological designs would be needed to provide more robust evidence regarding the effectiveness of psychological treatments for OCD within the Chinese population.

Conclusion

The current meta-analysis provides evidence for the effectiveness of psychological treatments in alleviating OCD symptom severity, with ERP emerging as the most effective treatment. CT and third-wave CBT were somewhat less effective, although only few trials were available for each treatment type. Thus, further research is needed to draw conclusions on comparative effectiveness. All treatment formats hold large effect sizes, but making treatment more intensive or involving family members could potentially improve effectiveness. Additionally, baseline OCD severity may predict treatment response. More evidence on long-term treatment effects is needed, as well as studies with more rigorous methodology and reporting. Finally, further evidence on diverse cultural contexts could offer valuable insights and would increase the generalizability of the findings.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S0033291724001375.

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Competing interests. The authors declare there are no conflicts of interest.

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