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REVIEW ARTICLE

Efficacy of group cognitive-behavioral therapy in adolescents with obsessive compulsive disorder: a systematic review and meta-analysis

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Objective: To evaluate the effectiveness of group cognitive-behavioral therapy (GCBT) for the treatment of adolescents with obsessive compulsive disorder (OCD).
Methods: This review was registered in PROSPERO under number CRD42020158475. Five databases (PubMed, Virtual Health Library, Web of Science, Scopus, and PsycINFO) were searched. After applying the inclusion and exclusion criteria, 13 studies were analyzed in the qualitative synthesis (i.e., systematic review) and eight in the quantitative synthesis (i.e., meta-analysis). For the latter, fixed-effect modeling was used to assess the primary outcome (i.e., OCD symptoms).
Results: The main findings suggest that GCBT is effective in reducing the symptoms of OCD in adolescents (d = -1.32). However, these results must be interpreted with caution, since all of the included studies showed some bias in their design.
Conclusions: GCBT is effective in reducing OCD symptoms in adolescents.

Keywords: Group cognitive-behavioral therapy; obsessive compulsive disorder; adolescents

Introduction

Obsessive compulsive disorder (OCD) is a serious mental illness, uncommon in young children (between 2-3 years old) and very common in adolescence,[1] and is among the ten diseases that most cause disability.[2] In Brazil, a study with 842 clinical patients found an average age at symptom onset of 12.4 years in men and 12.7 years in women,[3] with similar findings reported in the international literature,[4,5] and a prevalence of approximately 2 to 3% among children and adolescents.[4,6,7]

Considered multifactorial, with both genetic and environmental aspects involved in its pathogenesis,[8-10] OCD is four times more likely to develop in first-degree relatives of persons with the disorder.[11,12] In addition, as the course is chronic, it is usually lifelong if untreated, rarely remitting completely.[1] Establishing diagnosis and treatment as early as possible is important to prevent worsening of symptoms and increase the odds of complete remission.[13-15] A study with adolescents in southern Brazil found that only 9.3% of those diagnosed with OCD were aware of their diagnosis, and, of these, only 6.7% had undergone some type of treatment.[7] Since OCD is not always perceived by the family, there is often a long interval between the onset of symptoms and the search for treatment,[16-18] which can be a predictor of poor prognosis.[19]

In children and adolescents with OCD, both cognitive-behavioral therapy (CBT) and psychoactive drugs are effective in reducing obsessive-compulsive symptoms (OCS).[20,21] Treatment with CBT is superior to isolated pharmacotherapy.[22,23] The efficacy and effectiveness of CBT for OCD in this age group has been verified through clinical trials, systematic reviews, and meta-analyses.[20,22,24] Therefore, CBT is considered the first-line treatment of choice in children and adolescents with mild and moderate symptoms of OCD (e.g., predominance of compulsions, absence of comorbidities).[20,25,26] As a second-line choice, CBT combined with pharmacotherapy is recommended in cases of moderate to severe symptom intensity or when there is comorbid depression.[26,27]

Although the literature shows a reduction in symptoms after treatment, in practice there are some difficulties: 20 to 32% of children with OCD do not respond (or respond only partially) to individual CBT (ICBT), with or without concomitant medication.[15,20,25] Therefore, some researchers

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recommend the use of group CBT (GCBT) for the treatment of children and adolescents with OCD,[14,22,28-31] since there is evidence of a significant reduction in symptoms in adults undergoing this treatment modality.[32,33] In addition, evidence suggests that GCBT is more effective in treating OCD in adults than the use of fluoxetine.[32] Furthermore, it is highlighted that GCBT can treat a greater number of patients at the same time, thus making psychotherapy more accessible for the population.

Unfortunately, there are few studies evaluating the effectiveness of GCBT in children and adolescents with OCD.[34] Finally, considering that OCD symptoms usually start between 10 and 12 years of age,[3-5] and that, as far as we are aware, there are no systematic reviews with or without meta-analysis exclusively evaluating the effects of GCBT in adolescents with OCD, this study aims to evaluate the effectiveness of GCBT for the treatment of adolescents with OCD.

Method

A systematic review with meta-analysis was performed following the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines[35] and according to pre-established steps defined in the study protocol, as registered in PROSPERO (CRD42020158475). Data collection occurred through online searches of five databases: Virtual Health Library (BVS), Web of Science, Scopus, American Psychological Association database (PsycINFO), and PubMed (via MEDLINE).

To identify scientific studies related to the objective of this review, the following key descriptors were used: (''behavioral therapies'' or ''behavioral therapy'' or ''cognitive behavioral therapy'' or ''cognitive behavioral therapies'') and (adolescent * or adolescence or teen * or teenager * or youth *) and (obsessive compulsive disorder or obsessive-compulsive disorders or obsessive behavior or obsessive behaviors) and (group psychotherapy or group therapy). All descriptors were drawn from the Medical Subject Headings (MeSH/PubMed) and TheSaurus (PsycINFO) controlled vocabularies.

The searches were performed by two independent evaluators in April 2021. Although the same key descriptors were used in all databases, search strategies were customized for each database. For BVS, PubMed, Web of Science, and PsycINFO, all descriptors were used in a single line. This required the advanced search tab in BVS to ensure coverage of the titles and summary of articles. For Scopus, due to the inability of the database to group all descriptors on a single line, the query was divided into four lines: first line: (''behavioral therapies'' or ''behavioral therapy'' or ''cognitive behavior therapy'' or ''cognitive behavioral therapies''); second line: (adolescent * or adolescence or teen * or teenager * or youth *); third line: (obsessive compulsive disorder or obsessive-compulsive disorders or obsessive behavior or obsessive behaviors); fourth line: (group psychotherapy or group therapy). The filter ''article'' was used in Scopus, BVS, and Web of Science, while in PsycINFO, the filter ''journal'' was used. No filters were used in PubMed.

The total yield of the search of databases was imported into Rayyan,[36] an online tool developed to help authors of systematic reviews and meta-analyses store their results in a single online database and produce articles with higher quality and methodological rigor. This online platform has a blind review mode, which allows two or more reviewers to individually select articles. Reviewers can add comments to each article and group them into three categories: 1) included, 2) excluded, or 3) perhaps. In addition, Rayyan automatically identifies all duplicate articles and allows the blind review mode to be removed, automatically revealing a fourth category of articles called ''conflicts,'' which contains all the articles on which the reviewers had divergent opinions.[36] After excluding duplicate articles, the evaluators read the titles and abstracts of the remaining studies based on the following inclusion and exclusion criteria.

Eligibility criteria (PICOS)

Participants (P)

A study was eligible if its sample met the following criteria: 1) adolescents (age between 10 and 19 years) of any gender; 2) established diagnosis of OCD (any stage of illness) using any standard diagnostic criteria (e.g., DSM-5 or ICD-10).

A study was ineligible if its sample met the following criteria: 1) heterogeneous sample in the same intervention group (i.e., children and adolescents or adolescents and young adults), with group mean age under 10 or over 19; 2) sample composed exclusively of children (under 10); 3) sample composed exclusively of adults (over 19).

Interventions and comparators (I and C)

A study was eligible if its intervention and comparators met one of the following criteria: 1) at least one group in GCBT condition (alone or in combination with medication); 2) comparison of GCBT with itself (pre/post-test); 3) comparison of GCBT with ICBT or another form of individual or group psychotherapy (both online and face-to-face); 4) comparison of GCBT with medication use; 5) comparison of GCBT with any other forms of treatment (e.g., no treatment/waiting list/treatment as usual). A study was ineligible if it used only behavioral or only cognitive therapy.

Outcomes (O)

A study was eligible if its outcomes met the following criteria: 1) changes in OCD symptoms measured by Yale-Brown Obsessive-Compulsive Scale (Y-BOCS)[37] or Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS),[38] which is an adaptation of the Y-BOCS developed specifically for the assessment of children and adolescents, being the gold standard for measuring OCD symptoms in this age group[39]; 2) measurement of OCD symptoms on at least two time points (e.g., baseline and end of treatment).

Study design (S)

A study was eligible if its design met the following criteria: 1) randomized controlled trial or single group pre-post trial or any experimental and quasi-experimental design, regardless of the level of blinding (qualitative synthesis); 2) provides sufficient statistics to be included in the meta-analysis (quantitative synthesis). The year of publication and language of the papers were not restricted, aiming to find as many articles as possible. These criteria were first applied by two independent researchers during the screening of titles and abstracts in Rayyan. In the second stage, the remaining papers were read in full. The included papers were assessed for risk of bias using two tools: 1) Cochrane Collaboration risk of bias tool (RoB), which covers selection, performance, detection, attrition, reporting, and other bias for RCTs[40]; and 2) the Cochrane risk of bias tool to assess non-randomized studies of interventions (ROBINS-I), which covers confounding, selection, classification, deviation, missing data, and reporting bias, for non-RCTs.[41] Any inconsistencies between the two independent researchers were resolved by a third senior author. After these steps were completed, a manual reference search was conducted on all included full-text articles.

Data extraction

After selecting the articles, the extraction of all data was performed by two independent evaluators. To address the objectives of this systematic review, the following data were extracted from the included articles: 1) study identification (authors last name, design, year of study or publication); 2) country; 3) diagnosis (i.e., OCD and comorbidities); 4) sample size; 5) sample age (mean); 6) gender distribution; 7) study population; 8) OCD assessment measures; 9) main findings; 10) mean, standard deviation, or percentage in all groups at pre-test and post-test; 11) type and duration of interventions; 12) time point(s) of outcome measurement; 13) previous experience with psychotherapy; 14) risk of bias. Studies that did not present enough data to perform meta-analysis (e.g., number of participants in each group after drop-out, mean scores in the pre- and post-test, standard deviation [SD]) were excluded from the quantitative synthesis (i.e., meta-analysis), but were retained for the qualitative synthesis (i.e., systematic review).

Data synthesis

Meta-analyses were performed to evaluate the effectiveness of GCBT and other interventions in adolescents with OCD. The post-treatment effects and different control conditions or comparison to other interventions were evaluated. The meta-analyses were performed in R software 3.6, using the ''meta'' package, which allows estimation of fixed and random effects and the assessment of heterogeneity.[42] An I^2 statistic of $\geqslant$ 75% was deemed to indicate substantial levels of between-study heterogeneity.[43] The effects of GCBT were presented as standardized effect sizes (Cohen's *d*). An effect size $\geqslant$ 0.8 is considered a large clinical effect; an effect size $\geqslant$ 0.5, moderate; and $\geqslant$ 0.2, small.[44]

Results

Initially, 713 articles were found, with 13 studies remaining after application of the pre-established inclusion and exclusion criteria. A hand search of the references of these studies yielded no additional publications. Figure 1 shows a PRISMA flow diagram of data selection.[35] Table 1 lists the main characteristics of the studies and interventions. Table 2 lists the main characteristics of the participants.

Most of the included studies were conducted in Australia (n=5; 38.5%) and in the United States (n=4; 30.8%). Only two studies (15.3%) were performed in Brazil, one (7.7%) in Canada, and one (7.7%) in Iran. Of the 13 studies, six (46.1%) were RCTs and seven (53.9%) were non-randomized (i.e., quasi-experimental). Only three (23.1%) studies performed follow-up, and each used a different time to assess the effect after treatment (12, 18, and 84 months). Among the seven protocols used by the included studies, only two were followed by more than one of the studies. The most used protocol was "How I ran OCD off My Land" (n=4; 39.8%), which was tested on Brazilian samples.[22,52] Furthermore, only two (15.4%)[14,52] of the 13 included studies used the Y-BOCS measure OCD symptoms in adolescents. The other 11 (84.6%) studies used CY-BOCS.

Regarding the interventions and comparisons used, most protocols (n=7; 53.8%) used only pre- and post-test comparisons to identify the effectiveness of GCBT in adolescents with OCD. The Australian RCTs[13,14,30] all followed a similar methodology, with three groups: waiting list, individual cognitive-behavioral family therapy (ICBFT), and group cognitive-behavioral family therapy (GCBFT). Two other RCTs[22,52] compared the use of medication (sertraline and fluoxetine, respectively) with GCBT. Finally, the Iranian RCT compared individuals in three groups: acceptance and commitment therapy (ACT) + selective serotonin reuptake inhibitors (SSRI); GCBT + SSRI; and SSRI only.

The treatment lasted 7 to 14 weeks, with an average duration of $\pm$ 12.3 weeks. Sessions occurred once a week in all included studies. The duration of each session ranged from 60 to 120 minutes (average, 90 minutes). In addition, there was parental participation in all sessions of all included studies, except for study three, where parents could choose to participate in an extra weekly session. However, the time of participation and level of parental involvement in each study varied considerably: the briefest intervention with parents lasted 15 minutes at the end of the sessions,[55] while the longest had a group dedicated exclusively to parents with a duration of 60 minutes.[49]

The sample size of the included studies ranged from 15 to 85 participants. The sum of samples from all studies was 549, with an average of 45.75 (SD = 27.62) participants. The distribution by sex was matched in all studies, resulting in a total of 290 male (52.9%) and

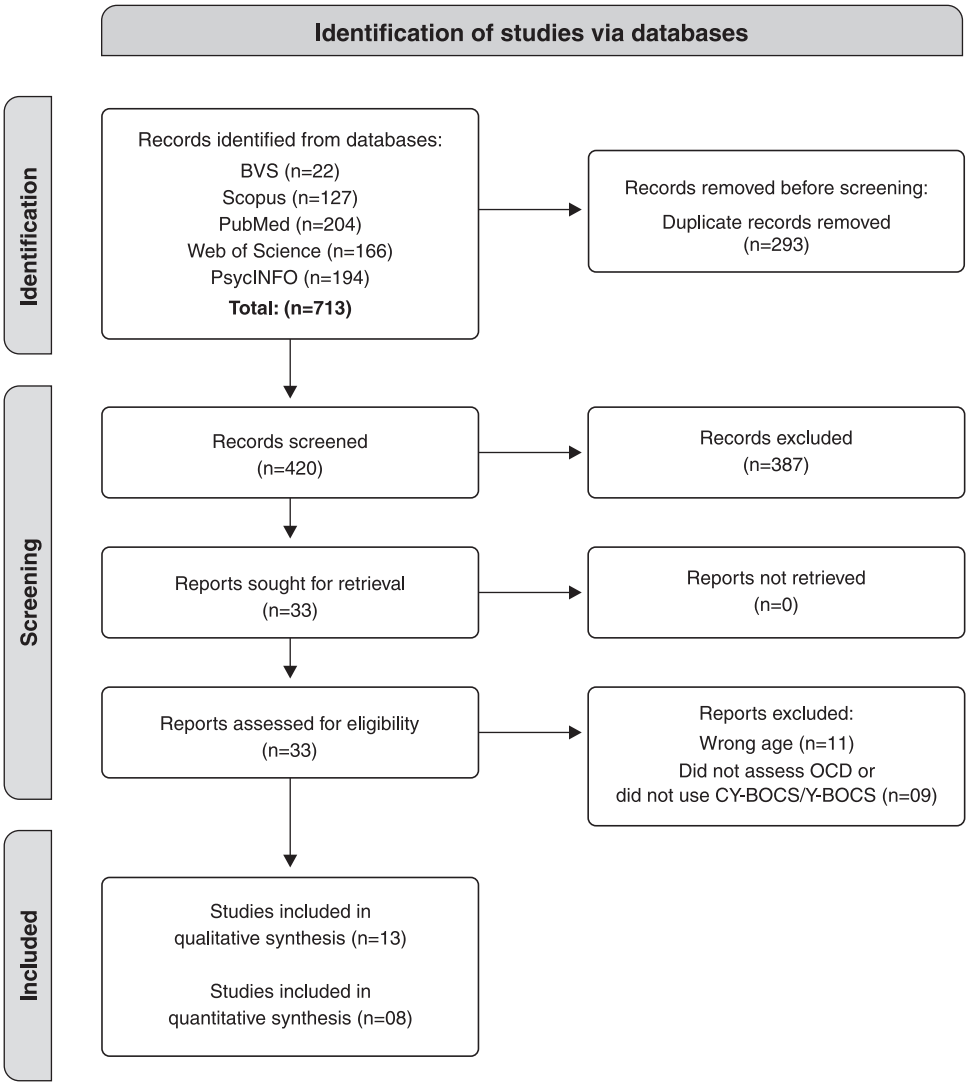

Figure 1 Flowchart. CY-BOCS = Children's Yale-Brown Obsessive Compulsive Scale; OCD = obsessive-compulsive disorder; Y-BOCS = Yale-Brown Obsessive Compulsive Scale.

258 female (47.1%) subjects. Anxiety disorders were the most prevalent comorbidities. However, four articles did not report whether the participants had any comorbidities.

Part of the samples from all included studies used some medication before or during GCBT interventions, with SSRIs being the most often used class of drugs. Although most studies (n = 8; 61.5%) reported which drugs were used, only RCTs controlled for the effect of these medications. In addition, most studies (n = 7; 38.5%) did not report how long the participants had been on medication. Among those studies that reported this variable (n = 4; 30.8%), participants remained on the same medication and dosage for 3 weeks to 3 months before the start of the GCBT intervention.

Meta-analysis

To perform the meta-analysis of the effect sizes of GCBT interventions, only the pre- and post-test measures of the studies included in the qualitative synthesis stage were considered. Follow-up measures were not evaluated due to incompatibility of time periods and regression toward the mean.[56,57] In addition, two of the studies (8 and 11) did not provide sufficient data (i.e., mean and standard deviation of the groups) for inclusion in the meta-analysis. Therefore, quantitative analyses were performed with eight of the 13 studies included in the qualitative synthesis (Figure 2).

All eight studies reported data on OCD symptom scores using the same psychometric instrument (i.e., Y-BOCS or CY-BOCS) and intervention (i.e., GCBT). A fixed-effect meta-analysis was estimated using mean, standard deviation, and sample size for each study and standard mean difference (SMD) as a measure of effect size. The main findings indicated an overall significant difference (d = -1.32) between pre-test and post-test scores in favor of GCBT. There was a slight difference between experimental and quasi-experimental designs. The effect observed in the experimental studies was greater (d = -2.07) compared to the quasi-experimental

Table 1 Characteristics of studies and interventions

Reference and country	Study design	Protocol used	Intervention (comparison)	Duration of treatment	Weekly sessions (duration)	Family participation (how many/ which sessions)	Outcome measures
Fischer,[28] United States	NRCT	A standardized behavioral group treatment program for obsessive-compulsive disorder[45]	GCBT (pre/ post-test)	7 weeks	1 (1.5h)	7 educational sessions (optional) open to everyone (family and clients)	CY-BOCS
Thienemann,[29] United States	NRCT	OCD in Children and Adolescent: A Cognitive-Behavioral Treatment Manual[46] - How I ran OCD off My Land	GCBT (pre/ post-test)	14 weeks	1 (2h)	Last 15 min of each session + 1 session with the participation of parents and siblings	CY- BOCS
Himle,[47] United States	NRCT	Group behavioral therapy for adolescents with obsessive-compulsive disorder[48]	GCBT (pre/ post-test)	7 weeks	1 (1.5h)	1 optional weekly session with patients and family	CY-BOCS
Barrett,[30] Australia	RCT	Freedom From Obsessions and Compulsions Using Cognitive-Behavioral Strategies (FOCUS)	GCBFT (ICBFT and waitlist)	14 weeks + 2 booster sessions after 1 month and after 3 months of the intervention	1 (1.5h)	50 min children10 min parents + children30 min parents (skills training)	CY-BOCS
Barrett,[13] Australia	12 and 18 months follow-up						
O'Leary,[14] Australia	7-year follow-up						Y-BOCS
Martin,[49] United States	NRCT	How I ran OCD off My Land[46]	GCBT (pre/ post-test)	14 weeks	1 (1.5h)	Two simultaneous groups:60 min children (G1)60 min parents (G2) At the end of each session, the groups got together for 30 min	CY-BOCS
Asbahr,[22] Brazil	RCT	How I ran OCD off My Land[46]	GCBT (sertraline)	12 weeks	1 (1.5h)	Last 15 min of each session + 1 session with the participation of parents and siblings	CY-BOCS
Farrell,[50] Australia	NRCT	OCD Busters (Child and Adolescent Versions)	GCBT (pre/pos-test)	13 weeks + 2 booster sessions after 1 month and after 3 months of the intervention	1 (1.5h)	Last 15 min of each session + 3 group sessions with parents (1 h) and two individual sessions with each family (1 h)	CY-BOCS
Lavell,[51] Australia	12 months follow-up						

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Table 1 (*continued*)

Reference and country	Study design	Protocol used	Intervention (comparison)	Duration of treatment	Weekly sessions (duration)	Family participation (how many/ which sessions)	Outcome measures
Fatori,[52] Brazil	RCT	How I ran OCD off My Land[46] > with language adaptation for Brazil through the Cordioli[53] protocol	GCBT (FLX)	14 weeks	1 (1.7h)	Parents of the FLX group were invited to accompany their children during biweekly consultations with the doctor. Last 15 min of each session + 1 session with the participation of parents and siblings	Y-BOCS
Selles,[54] Canada	NRCT	OCD is Not the Boss of Me	GFCBT (pre/ pos-test)	12 weeks	1 (1.5h)	Parents participated in a Parent Group and in the final 15-30 min of each session they join their children to answer questions and receive the homework	CY-BOCS
Shabani,[55] Iran	RCT	How I ran OCD off My Land [46]	GCBT + SSRI (ACT + SSRI and SSRI)	12 weeks	1 (1h)	Last 5 min of each session, they received a summary of what was discussed and were instructed not to reinforce obsessive behaviors	CY-BOCS

ACT = acceptance and commitment therapy; CY-BOCS = Children's Yale-Brown Obsessive Compulsive Scale; FLX = fluoxetine; GCBT = group cognitive-behavioral therapy; GCBFT = group cognitive-behavioral family therapy; GFCBT = group family-based cognitive behavioral therapy; ICBFT = individual cognitive-behavioral family therapy; NR = not reported; NRCT = non-randomized clinical trial; OCD = obsessive compulsive disorder; RCT = randomized clinical trial; SSRI = selective serotonin reuptake inhibitors; Y-BOCS = Yale-Brown Obsessive Compulsive Scale.

Table 2 Characteristics of the participants

Study	Sample size	Mean age (SD)	Sex ratio	Psychiatric comorbidities	SMP	Medication	Time of use
Fischer[28]	15	14.5 (NR)	9M; 6F	NR	67%	SSRI	3 weeks BI
Thienemann[29]	18	15.2 (NR)	12M; 6F	SOPH (n=3); MD (n=3); ED (n=1); SPPH (n=1); TD (n =1); TS (n=1); ID (n=1)	83%	NR	NR
Himle[47]	19	14.63 (1.71)	11M; 8F	MD (n=7); DYS (n=1); ADHD (n=4); ODD (n=2); SAD (n=4); PD (n=1); SOPH (n=1); AG (n=2); SPPH (n=2); GAD (n=1)	68%	SSRI (n=17) Stimulant for ADHD (n=6)	3 weeks BI
Barrett[30]	77	ICBFT – 10.75 (2.54)	ICBFT (12M;12F)	GAD (n=46); SPPH (n=27); SOPH (n=15); SAD (n=13); DYS (n=4); MD (n=2)	ICBFT (12.5%)	NR	3 months BI
		GCBFT – 12.90 (2.30) Waitlist – 11.75 (3.05)	GCBFT (13M;16F) Waitlist (13M;11F)		GCBFT (20.7%) Waitlist (21%)		
Barrett[13]	48	ICBFT – 12.91 (2.57) GCBFT – 14.65 (2.30)	ICBFT (11M;11F) GCBFT (12M;14F)	NR	ICBFT (9%) GCBFT (15%)	NR	NR
O'Leary[14]	38	ICBFT – 17.6 (2.75) GCBFT – 19.2 (2.81)	ICBFT (9M;10F) GCBFT (11M;8F)	NR	34%	SSRI	NR
Martin[49]	14	11.3 (NR)	4M; 9F	ADHD (n=5); PDD or NVLD (n=4); TTM (n=2); SSPH (n=2); GAD (n=1); TD (n=1); SOPH (n=1)	64%	SSRI(n=9); Stimulant for ADHD (n=4)	NR
Asbahr[22]	40	GCBT – 13.7 (2.32)	GCBT (15M; 5F)	MD (n=7); mania (n=1); anxiety disorders (n=12); ODD (n=6); TD (n=21); enuresis (n=4); ADHD (n=9); ED (n=1)	Only group Sertraline	SSRI	-
		Sertraline – 12.4 (2.76)	Sertraline (11M; 9F)				
Farrell[50]	43	11.09(2.52)	30M 13F	GAD (n=14); SAD (n=4); SOPH (n=8); SPPH (n=11); MD (n=3); DYS (n=2); ADHD (n=8); ODD (n=1); PDD (n=15)	67%	SSRI	NR
Lavell[51]							
Fatori[52]	83	GCBT – 11.4 (3.2)	GCBT (22M; 18F)	MD (n=16); anxiety disorders (n=65); disruptive disorders (n=23); TD (n=17)	Only group FLX	SSRI	-
		FLX – 12.1 (3.1)	FLX (18M; 25F)				

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Table 2 (*continued*)

Study	Sample size	Mean age (SD)	Sex ratio	Psychiatric comorbidities	SMP	Medication	Time of use
Selles[54]	85	13.9 (2.49)	39M;46F	GAD (n=21); TD; (n=13); ADHD (n=12); AS (n=12); SPPH (n=4); SAD (n=4); ODD (n=2); MD (n=1)	44.7%	NR	NR
Shabani[55]	69	GCBT – 14.95 (1.78) ACT – 14.95 (1.43) SSRI – 14.96 (1.24)	GCBT (12M;10F) ACT (12M;10F) SSRI (14M;11F)	NR	100%	SSRI	3 months BI

ACT = acceptance and commitment therapy; AG = agoraphobia; ADHD = attention deficit/hyperactivity disorder; BI = before intervention; DYS = dysthymic disorder; ED = eating disorder; F = female; FLX = fluoxetine; GAD = generalized anxiety disorder; GCBT = group cognitive-behavioral therapy; GCBFT = group cognitive-behavioral family therapy; ICBFT = individual cognitive-behavioral family therapy; ID = intellectual disability; M = male; MD = major depression; NR = not reported; NVLD = non-verbal learning disorder; ODD = oppositional defiant disorder; PD = panic disorder; PDD = pervasive developmental disorder; SA = social anxiety; SAD = separation anxiety disorder; SD = standard deviation; SMP = sample medication use; SOPH = social phobia; SPPH = specific phobia; SSRI = selective serotonin reuptake inhibitors; TD = tic disorder; TS = Tourette syndrome; TTM = trichotillomania.

studies (d = -1.15), probably due to greater control for intervening variables. In addition, the study intervention conducted by Shabani et al.,[55] which consisted of a combination of GCBT and SSRI, had an effect similar to that of a GCBT-only intervention in the study by Barrett et al.[30]

As for quasi-experimental studies, those of Selles et al.[54] and Farrell et al.[50] represent 52.1% of the weight of this meta-analysis. This may be associated with their considerably greater number of participants. Finally, there is a significant level of heterogeneity in the overall model (I^2 = 60%), which may be related to participants' comorbidities, previous experience with individual CBT, and/or medication use.

Risk of bias in included studies

A summary of the possible biases in the selected studies (evaluated with ROBINS-I for NRCTs,[41] and with RoB for RCTs[40]) is presented in Table 3. All studies showed a high risk of bias in at least one of the topics analyzed. All NRCTs were classified as having a high risk of confounding bias due to sample medication use, multiple comorbidities, or previous treatment with CBT. One study was classified as high risk of selection bias due to selection of participants for the intervention based on the clinical perception that these individuals would benefit from the treatment modality. Three studies were classified as unclear risk of measurement bias due to the lack of information regarding use of the CY-BOCS/Y-BOCS by raters who were not involved in providing group treatment. All studies were classified as unclear risk of reporting bias due to non-presentation of the registration number of the clinical trial and/or non-publication of the study protocol. None of the studies were classified as having a high risk of classification or deviation bias.

All RCTs were classified as having a low risk of selection, performance, detection, and attrition bias. Half of the RCTs (n=2) were classified as unclear risk of reporting bias due to non-presentation of the registration number of the clinical trial and/or non-publication of the protocol. Other sources of bias involved the assessment of bias from previous experience with CBT. This bias was classified as high risk in one RCT since at least one-third of the samples had already undergone CBT in the past. In addition, although five NRCTs also included participants with previous experience with CBT, only one of these trials (study 3) reported how long the participants underwent prior treatment. Thus, at least four NRCTs (studies 1, 2, 7, 12) and one RCT (study 11) may not have controlled for possible effects related to previous experience with psychotherapy.

Discussion

This systematic review with meta-analysis aimed to assess the effectiveness of GCBT in adolescents with OCD. After an extensive review of the scientific literature, 13 studies (RCTs or NRCTs) were identified, which used seven different intervention protocols. The main results suggest that GCBT for adolescents is effective in

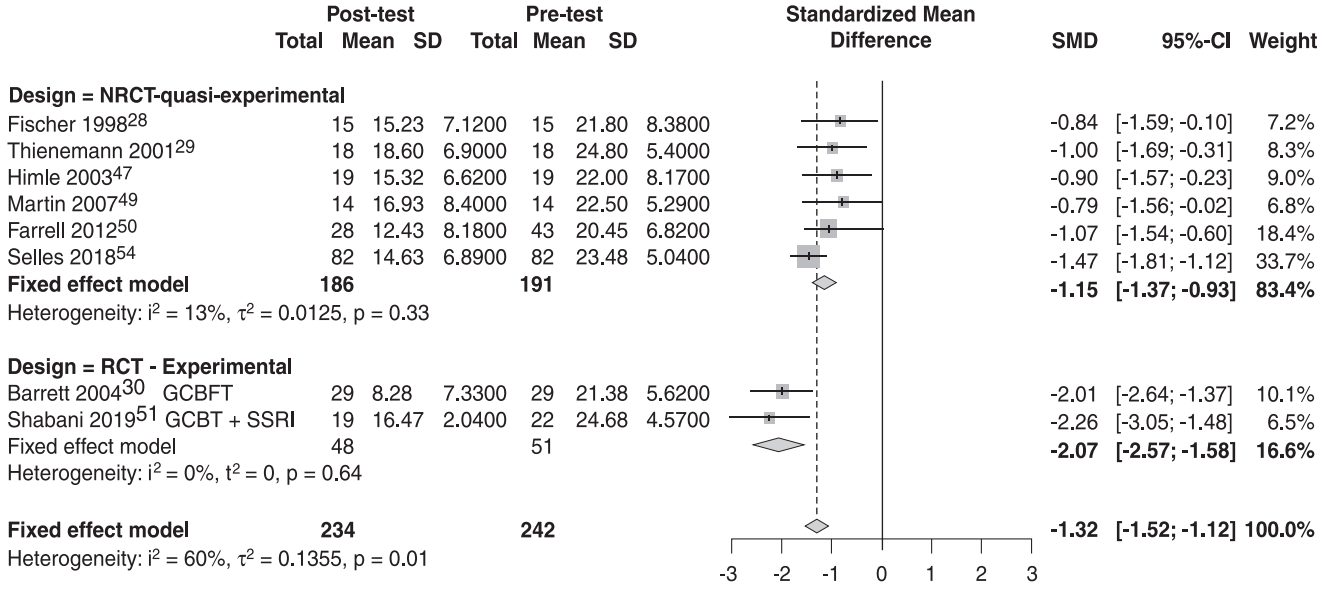

Figure 2 Fixed effects, standard mean difference (SMD), and accompanying 95% confidence interval (CI) for group cognitive-behavioral therapy (GCBT) interventions on OCD scores. GCBFT = group cognitive-behavioral family therapy; ICBFT = individual cognitive-behavioral family therapy; NRCT = non-randomized controlled trial; RCT = randomized controlled trial; SD = standard deviation; SSRI = selective serotonin reuptake inhibitors.

reducing the symptoms of OCD, with a reduction of approximately one standard deviation in symptoms between pre-intervention and post-intervention time points; in experimental studies, this reduction reached two standard deviations. Similar results (g = 1.21) were also found in another meta-analysis that evaluated the effectiveness of ICBT in children and adolescents. Even so, our results should be interpreted with caution, especially considering the small number of RCTs and the fact that all NRCTs were classified as having a high risk of bias in at least one of the topics analyzed, especially in confounding bias due to previous experience with CBT and medication use. In this sense, it is not possible to ensure that the effects observed in the meta-analysis of NRCTs are exclusively due to the GCBT interventions.

In addition, most of the protocols (n=6) included in this review were tested by only one study. This small number of RCTs and NRCTs assessing the effectiveness of CBT in adolescents with OCD was also reported by another meta-analysis that aimed to investigate the effect size of CBT interventions in children and adolescents with several conditions, including OCD, anxiety, and depression.[34]

Some evidence suggests that treatment structure (e.g., parental involvement, relapse maintenance/prevention sessions, reinforcement sessions) can influence the effect size of an intervention.[34] This finding is not corroborated by our meta-analysis, since the interventions that used reinforcement sessions (i.e., booster sessions)[30,50] had no larger effect size than most of the other studies included. Although the study by Shabani et al.[55] showed the largest effect size in our meta-analysis, this effect may be associated with the use of combined treatment (i.e., GCBT + SSRI). In the case of the study by Selles et al.,[54] which had the largest effect size among NCRTs, this effect may have been associated with the level of previous experience with psychotherapy and/or medication use by 44.7% of the sample. Thus, these variables may have been poorly controlled during the sample selection.

In this sense, some studies indicate the possible influence of medication use (i.e., dosage and time of use) by part of the sample[58] and/or previous experience with individual CBT or other psychotherapies on the results of GCBT interventions – especially considering that even individuals who do not respond well to individual CBT may experience some symptomatic improvement of OCD or comorbidities.[59] In addition, some authors suggest that, compared to GCBT (40.9%), individual CBT yields a higher recovery rate (68.75%) in adults treated for OCD, and this rate remains higher in individual CBT (62.5%) even 1 year after the interventions.[60] On the other hand, meta-analyses suggest that there is no significant difference in the effectiveness of individual CBT compared to GCBT in adult samples, with greater use of GCBT being recommended, as this modality can reduce waitlisting in health services.[59,61]

Thus, there is a need for additional studies that investigate the effectiveness of GCBT in the treatment of adolescents with OCD considering the possibility of differences in the effect size that may be associated with the use of different intervention protocols or structures. In addition, the need for greater control of possible intervening variables (e.g., previous experience with individual CBT and/or use of medication) must be emphasized.

No conclusive evidence was identified considering the influence of a greater or lesser number of sessions (e.g., 7 or 14 sessions) or the duration of each session

Table 3 Risk of bias in included studies

Study: ROBINS-I	Confounding bias	Selection bias	Classification bias	Deviation bias	Missing data bias	Measurement bias	Reporting bias
Fischer[28]	+	+	-	-	-	-	?
Thienemann[29]	+	-	-	-	-	?	?
Himle[47]	+	-	-	-	-	-	?
Martin[49]	+	-	-	-	-	-	?
Farrell,[50] Lavell[51]	+	-	-	-	-	?	?
Selles[54]	+	-	-	-	-	?	?

Study: RoB	Selection bias	Performance bias	Detection bias	Attrition bias	Reporting bias	Previous experience with CBT (%)†	When
Barrett,[13] O'Leary,[14] Martin[49]	-	-	-	-	?	-	-
Asbahr[22]	-	-	-	-	?	-	-
Fatori[52]	-	-	-	-	-	+ (34%)	?
Shabani[55]	-	-	-	-	-	-	-

† Percentage of the sample with previous experience with CBT.
+ = high risk of bias; - = low risk of bias; ? = unclear risk of bias; RoB = Cochrane Collaboration risk of bias tool; ROBINS-I = Cochrane risk of bias tool to assess non-randomized studies of interventions.

(e.g., 90 or 120 minutes) on the effect size of the interventions. The effect size of the protocols that provided for seven sessions lasting 90 minutes[28,47] was similar to the effects of studies that followed protocols that recommended 14 sessions lasting 90 minutes[49] and 120 minutes.[29] This finding is corroborated by other systematic reviews, which also found no evidence to support that the number or duration of sessions is associated with the effect size of the interventions.[34,62] In any case, the hypothesis that increasing the number or duration of sessions will not result in greater efficacy in treatments with GCBT in adolescents with OCD must be confirmed by new RCTs.

The main limitations of this systematic review and meta-analysis concern the fact that only five databases were searched. Although these are the main databases in the field, other relevant studies may have been indexed in other databases. Another limitation concerns our absence of subgroup analyses (e.g., comparison between the effects of other interventions and GCBT) as proposed in the PROSPERO protocol. Such analyses were not performed since the included studies used different types of interventions that were not repeated between the studies and/or did not present enough data for inclusion in the meta- analysis (i.e., mean and standard deviation of the groups). In addition, most of the studies found were NRCTs with a sample allocated to a single pre- and post-test comparison group. Therefore, more RCTs that assess the effectiveness of GCBT compared to ICBT and control groups are recommended.

Finally, regardless of the country of origin of the seven intervention protocols located in our review, all were written in English. Considering the small number of protocols and their publication in a single language, the development and/or cross-cultural adaptation of protocols for the treatment of adolescents with OCD from other cultures/nationalities is recommended.

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Disclosure

The authors report no conflicts of interest.

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