

Does CBT have lasting effects in the treatment of PTSD after one year of follow-up? A systematic review of randomized controlled trials

A TCC possui efeitos duradouros no tratamento do TEPT após um ano de seguimento? Revisão sistemática de ensaios clínicos randomizados

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Abstract

Introduction: While several previous meta-analyses have documented the short-term efficacy of cognitive-behavioral therapy (CBT), its long-term efficacy remains unknown. Post-traumatic stress disorder (PTSD) is a serious, debilitating, often chronic and disabling disease.

Objective: To estimate the long-term efficacy of CBT in the treatment of PTSD by assessing the maintenance of the effect after one year of follow-up.

Method: We performed a systematic review through electronic database searches including ISI Web of Science, PubMed, PsycInfo and Pilots. We included randomized studies in which CBT was compared with a control group (waiting list or usual care) in adults with PTSD that reported at least one year of CBT follow-up.

Results: Our search identified 2,324 studies and 8 were selected. CBT was shown to be effective in the treatment of PTSD in the post-treatment period. Improvement in PTSD symptoms was statistically significant in relation to the control group. The improvement observed in the treatment group or single group (formed by both treatment group and control group, which was submitted to the intervention after a few weeks on the waiting list) was maintained in the follow-up.

Conclusion: Due to the lack of control groups in the follow-up period in six of the eight studies included in this review, there is still no proper methodological basis to assert that CBT has lasting effects in the treatment of PTSD. Our study found serious methodological shortcomings and the need to fill this gap in the literature through the development of studies with robust and sophisticated designs.

Keywords: Post-traumatic stress disorder, cognitive-behavioral therapy, follow-up, lasting effects.

Resumo

Introdução: Várias meta-análises anteriores documentaram a eficácia a curto prazo da terapia cognitivo-comportamental (TCC). No entanto, sua eficácia a longo prazo permanece desconhecida. O transtorno de estresse pós-traumático (TEPT) é uma doença crônica grave, debilitante e incapacitante.

Objetivo: Estimar a eficácia a longo prazo da TCC no tratamento do TEPT, avaliando a manutenção do efeito após um ano de seguimento.

Métodos: Realizamos uma revisão sistemática através de pesquisas nas bases de dados eletrônicas ISI Web of Science, PubMed, PsycInfo e Pilots. Incluímos estudos randomizados nos quais a TCC foi comparada com um grupo controle (lista de espera ou tratamento usual) em adultos com TEPT que relataram pelo menos um ano de seguimento da TCC.

Resultados: A pesquisa identificou 2.324 estudos e 8 foram selecionados. A TCC mostrou-se eficaz no tratamento do TEPT no período pós-tratamento. A melhora nos sintomas de TEPT foi estatisticamente significativa em relação ao grupo controle. A melhora observada no grupo de tratamento ou grupo único (formado por ambos os grupos de tratamento e controle, que foi submetido à intervenção após algumas semanas na lista de espera) foi mantida no seguimento.

Conclusão: Devido à ausência de grupo controle no período de follow-up em 6 dos 8 estudos incluídos nesta revisão, ainda não há base metodológica adequada para afirmar que a TCC tem efeitos duradouros no tratamento do TEPT. Nosso estudo encontrou graves deficiências metodológicas e a necessidade de preencher essa lacuna na literatura através de estudos com delineamentos robustos e sofisticados.

Descritores: Transtorno de estresse pós-traumático, terapia cognitivo-comportamental, seguimento, efeitos duradouros.

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Introduction

Post-traumatic stress disorder (PTSD) has a lifetime prevalence of about 6.8% in the general population.¹ It is a serious, debilitating, and when untreated, often chronic and disabling disease, severely compromising the quality of life of the individual. No anxiety disorder generates as many costs for the health systems and economies of so many countries as PTSD.² PTSD occurs in trauma-exposed individuals who present core symptoms of re-experiencing (e.g., intrusive thoughts or nightmares about the trauma), avoidance of trauma-related reminders, negative alterations in cognitions and mood (e.g., exaggerated blame of self or others for causing the trauma and difficulty experiencing positive affect), and alterations in arousal and reactivity (e.g., sleep disturbance and irritability or aggression).³

Cognitive-behavioral therapy (CBT) is the most extensively tested form of psychotherapy.⁴ Most guidelines for PTSD treatment consider psychological treatments with a focus on trauma, including CBT, as a first treatment option, and pharmacological treatment as an adjunct or second option.⁵

The short-term efficacy of CBT in the treatment of PTSD is well documented in several meta-analyses.^{6,7} Yet, as far as we know, no meta-analysis has evaluated whether the effects of CBT in the treatment of PTSD are long-lasting. The development and dissemination of effective treatments that have lasting effects is imperative.⁸ Generally, for the effects of a treatment to be considered long-lasting, it is necessary that the changes produced are stable over the long term, extending beyond the end of the intervention period.⁹

Regarding anxiety disorders, we found only one meta-analysis evaluating the effect of long-term psychotherapies. Flückiger et al.¹⁰ examined the lasting efficacy of evidence-based psychotherapies compared to treatment as usual (TAU) in acute anxiety and depression. Usual treatment was defined in that study as interventions declared by the authors as "usual care," "usual treatment," or "standard care," without having to involve interventions where therapists are instructed to avoid specific techniques and procedures that they would normally use (required for an intervention to be considered as "usual treatment" in many studies). The results did not indicate the superiority of evidence-based psychotherapy for depression and acute anxiety compared to usual care in the follow-up assessment. However, no study evaluating PTSD was included in this meta-analysis.

Thus, the present study aims to fill the gap in the literature about the effectiveness of CBT in maintaining the gains made in the treatment of PTSD in the long run, answering the question of whether CBT has lasting

effects in the treatment of PTSD after one year of follow-up. To answer this question, we conducted a systematic review of randomized clinical trials.

Methodology

Literature search

We performed electronic searches in four large databases: ISI Web of Science, PubMed, PsycInfo and Pilots. The following terms were combined: (PTSD OR "stress disorder") AND ("cognitive behavio* therap*" OR CBT OR "behavio* therap*" OR "cognitive therap*") AND ("follow-up" OR followup OR "follow up"). We also performed manual searches of the references of previous meta-analyses and the articles selected for the study. Searches were carried out until July 10, 2016. No filters were used to limit languages or years.

Inclusion and exclusion criteria

Randomized studies of adults with PTSD, in which CBT was compared to a control group (waiting list or usual care) and that reported at least one year of CBT follow-up, were selected. In addition, the following inclusion criteria were adopted: 1) studies in which the subjects recruited fulfilled the diagnostic criteria for PTSD according to a structured diagnostic interview; 2) studies in which cognitive restructuring was a major component of the treatment, treatments based on behavioral therapy, particularly exposure therapy, and treatments that used a combination of cognitive restructuring and exposure therapy.

We excluded studies in which the active treatment used only interpersonal therapy, psychodynamic therapy, virtual reality, eye movement desensitization and reprocessing (EMDR), applied relaxation or systematic desensitization, and studies in which CBT was combined with a placebo pill. Studies with adolescents (under 18 years of age) were excluded. Books, book chapters, dissertations and reviews, meta-analyses, theoretical articles, non-randomized controlled studies, open trials, case studies, and animal studies were also excluded.

To keep heterogeneity as low as possible, we followed the methodological recommendations of Cuijpers et al.⁴ and included only studies that used as a control group a waiting list or TAU group. TAU was defined as any treatment that patients would normally receive, provided it was not considered a structured type of psychotherapy.

Evaluation of the methodological quality of the studies

We assessed the methodological quality of the follow-up period of the included studies using an adaptation

of the Cochrane Collaboration bias risk assessment tool.¹¹ In addition to the original proposed criteria, we added the following criteria: treatment description (or reference). Each study included in the review was classified as either low risk, high risk or unclear risk of bias in each of the criteria used.

The assessment of methodological quality did not consider the data reported after treatment, but was based on the data reported in the follow-up period, as this was the focus of this review. We performed a critical analysis of these studies but did not use the findings as an exclusion criterion, so even if we found a study classified as having a “high risk” of bias, it was included anyway. Figures were produced to illustrate the outcome of the review using the software Review Manager 5.¹²

Results

Our search identified 2,324 studies. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart,¹³ which describes the inclusion process and the reasons for exclusion of the studies, is presented in Figure 1. A total of 8 studies¹⁴⁻²¹ met the inclusion criteria for this systematic review.

The studies were altered between their initial design and the period when the follow-up assessment began, so that six of the eight studies failed to have a control group at some point in the follow-up period. For this reason, we chose to present the characteristics of the selected studies in two stages: post-treatment period (Table 1) and follow-up period (Table 2).

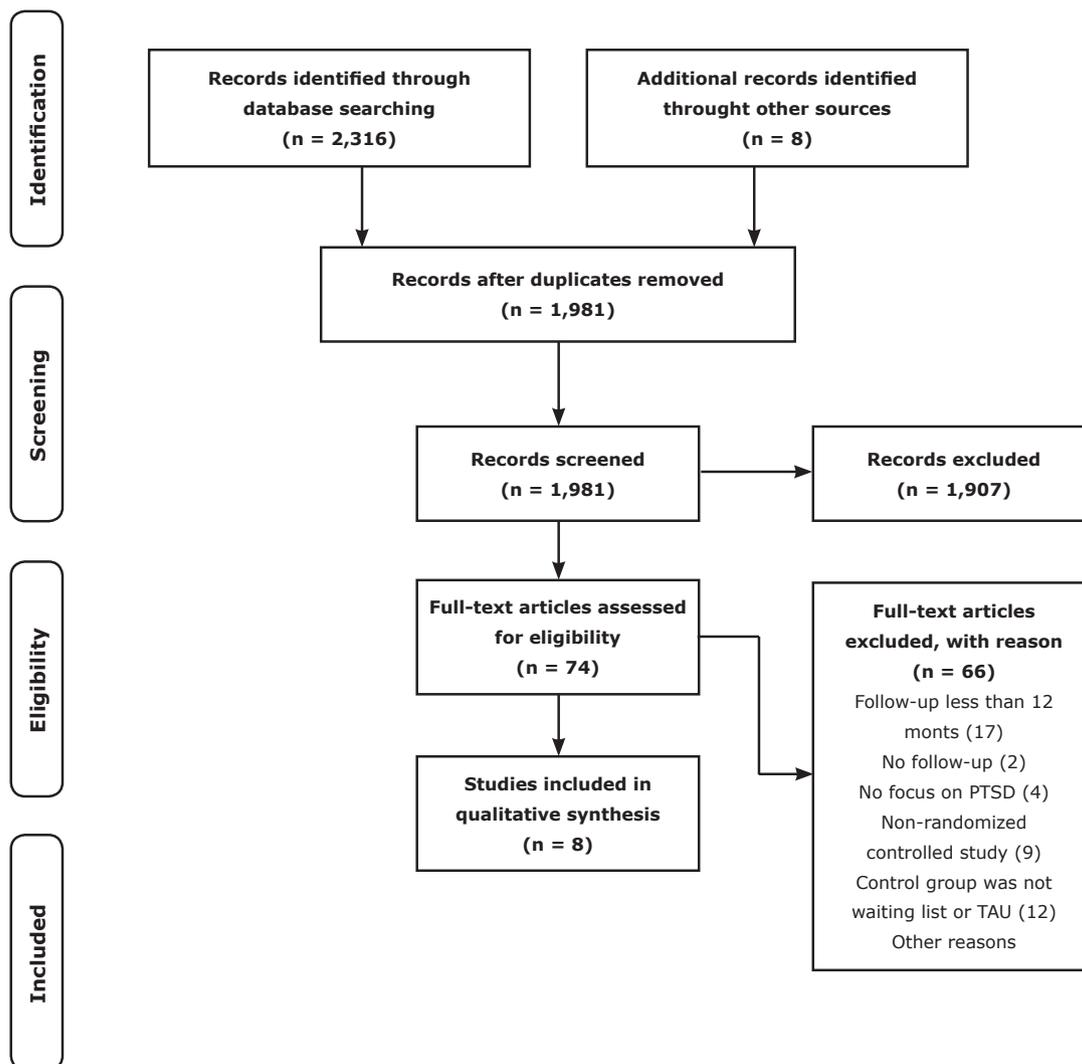


Figure 1 - PRISMA flow diagram of search strategy for systematic review and meta-analysis. TAU = treatment as usual.

The number of CBT treatment sessions ranged from 9 to 17 in most studies. The time of each session ranged from 45 to 120 minutes. With regard to the components of CBT, five studies used cognitive restructuring and exposure therapy.^{16-19,21} Two studies used only exposure therapy,^{14,20} and one study used cognitive processing therapy.¹⁵

In five studies, the control group comprised a waiting list,^{15-18,21} while two studies used TAU.^{14,20}

Nacasch et al.²⁰ defined TAU as psychodynamic therapy and/or medication or counseling, and Asukai et al.¹⁴ as pharmacotherapy and supportive counseling. One study used brief treatment,¹⁹ which offered the same breathing and psychoeducation training components as the CBT program, but without the cognitive restructuring.

The CBT groups showed a more significant reduction in PTSD symptoms in the post-treatment period

Table 1 - Characteristics of selected studies at post-treatment

Study	n at baseline, n at the end	Mean age % of women	Intervention	Control Group	Components of CBT	Protocol	Instrument	Main results
Azukai et al. ¹⁴	24 (PE = 12, TAU = 12) 24 (PE = 12, TAU = 12)	27.1±5.4 (PE) 31.4±8.8 (TAU)	PE	TAU	PE	8 to 15 sessions of 90 minutes 1x per week	CAPS	The intervention group had a greater reduction in PTSD symptoms than the control group after treatment (p < 0.01). The control group also showed a significant decrease in severity of PTSD symptoms after being treated with PE.
Chard ¹⁵	71 (CPT = 36, WL = 35) 55 (CPT = 28, WL = 27)	32.77±8.87 100%	CPT	WL	CPT	17 sessions of 90 min (in group) and 9 sessions (individual) of 60 min in the first 9 weeks 1 x per week	CAPS	The severity of PTSD symptoms after treatment was lower in the intervention group (p < 0.01).
Foa et al. ¹⁶	96 79 (PE = 23, SIT = 19, PE + SIT = 22, WL = 5)	34.9±10.6 100%	PE SIT PE + SIT	WL	CR PE SIT	9 sessions 2x per week	PSS-I	There was a reduction in the severity of PTSD symptoms in the intervention groups in relation to the waiting list (p < 0.01).
Foa et al. ¹⁷	171 (PE/CR = 74, PE = 79, WL = 26) 121 (PE/CR = 44, PE = 52, WL = 25)	31.3±9.8 100%	PE PE + CR	WL	CR PE	9 to 12 sessions of 90 to 120 min 1x per week	PSS-I	The intervention groups obtained a greater reduction in PTSD symptoms than that observed in the control group (p < 0.05).
Knaevelsrud et al. ¹⁸	96 (CBT = 49, WL = 47) 87 (CBT = 41, WL = 46)	34±11.5 (CBT), 36±9.6 (WL) 84% (CBT), 96% (WL)	CBT	WL	CR PE	10 sessions (Internet) of 45 minutes 2x per week	IES-R	The severity of PTSD symptoms after treatment was lower in the intervention group (p < 0.05).
Mueser et al. ¹⁹	201 (CBT = 104, Brief = 97) 161 (CBT = 86, Brief = 75)	42.96±10.46 (CBT), 44.52±11.60 (Brief) 70.2% (CBT), 67% (Brief)	CBT	Brief	CR	12 to 16 sessions of 60 min 1x per week	CAPS	Participants in both programs had an improvement in PTSD symptoms after treatment. The intervention group had greater improvement than the control group (p = 0.01).
Nacasch et al. ²⁰	30 (PE = 15, TAU = 15) 26 (PE = 13, TAU = 13)	34.8±11.4 (PE), 33.7±11.9 (TAU) 7%	PE	TAU	PE	9 to 15 sessions of 90 to 120 minutes 1x per week	PSS-I	The severity of PTSD after treatment was lower in the intervention group compared to the control group (p < 0.01).
Power et al. ²¹	105 (EMDR = 39, PE + CR = 37, WL = 29) 72 (EMDR = 27, PE + CR = 21, WL = 24)	38.6±11.8 (EMDR), 43.2±11.0 (PE + CR), 36.5±11.6 (WL)	E + CR EMDR	WL	CR PE	10 sessions of 90 min 1 x per week	CAPS	There were reductions in PTSD symptoms after treatment in the intervention group (p < 0.05), but no change in the control group. Both treatments were effective in relation to the control group.

Brief = brief treatment; CAPS = clinician-administered PTSD scale; CBT = cognitive-behavioral therapy; CPT = cognitive processing therapy; CR = cognitive restructuring; EMDR = eye movement desensitization and reprocessing; IES-R = impact of events scale; PE = prolonged exposure; PSS = perceived stress scale; PTSD = post-traumatic stress disorder; SIT = stress inoculation training; TAU = treatment as usual; WL = waiting list.

compared to the control groups in all eight studies included in this review. In all cases, this difference reached statistically significant p-values. Although six studies no longer reported the presence of control groups in the follow-up period, in all the studies the improvement obtained in the treatment group or in the single group (formed by the intervention group plus the control group, which received the intervention after a few weeks on the waiting list) was maintained in this period.

Evaluation of the methodological quality of the studies

The results of the assessment of methodological quality, based on an adaptation of the Cochrane Collaboration proposal,¹¹ is shown in Figures 2 and 3. This analysis took into account only the period of at least 12 months of follow-up.

Only two of the eight studies were randomized in the follow-up period. Mueser et al.¹⁹ made use of software

to obtain the random sequence, and used procedures so that the person in charge of selecting the participants did not know, a priori, the allocation group. In the case of Nacasch et al.,²⁰ this information was not available. All the other six studies that did not use a control group in the follow-up period were considered as having a high risk of bias in respect to losses for the outcome of interest in this review. Considering the two studies with control groups in the follow-up period, only Mueser et al.¹⁹ presented results for all primary outcomes of interest. All studies provided a good description of the treatment or provided references to it.

Discussion

To our knowledge, this is the first systematic review to investigate, through randomized controlled trials, whether the effects of CBT in the treatment of PTSD are maintained during at least one year of follow-up.

Table 2 - Characteristics of selected studies at follow-up

Study	n at start of follow-up, n at the end of follow-up	Follow-up period	Control group in the follow-up period	Main results
Azukai et al. ¹⁴	24 (PE = 12, TAU = 12) 19 (PE + TAU who received the intervention from the 10th week)	12 months	No (Single group formed by the intervention + control group that received the intervention from the 10th week)	The significant reduction in PTSD symptoms observed in the intervention group (and in the control group receiving the intervention) after treatment was also observed in the single group created in the follow-up period.
Chard ¹⁵	55 (CPT = 28, WL = 27) 27 (CPT + WL who received intervention from week 17)	12 months	No	Significant reductions in PTSD symptoms in the intervention group after treatment were maintained at follow-up.
Foa et al. ¹⁶	79 (PE = 23, SIT = 19, PE + SIT = 22, WL = 15) 46 (PE = 16, SIT = 14, PE + SIT = 16)	12 months	No	Significant reductions in PTSD symptoms after treatment in the intervention groups were maintained at follow-up.
Foa et al. ¹⁷	121 (PE/CR = 44, PE = 52, WL = 25) 53 (PE/CR = 25, PE = 28)	12 months	No	Significant reductions in post-treatment PTSD symptoms compared to the control group were maintained at follow-up.
Knaevelsrud et al. ¹⁸	87 (CBT = 41, WL = 46) 34 (CBT)	18 months	No	Significant reductions in PTSD symptoms in the intervention group after treatment were maintained at follow-up.
Mueser et al. ¹⁹	161 (CBT = 86, Brief = 75) 156 (CBT = 83, Brief = 73)	12 months	Yes (Brief)	A significant improvement in PTSD symptoms in the intervention group compared to the control group observed in the post-treatment period remained at follow-up.
Nacasch et al. ²⁰	26 (PE = 13, TAU = 13) 22 (PE = 13, TAU = 9)	12 months	Yes (TAU)	There was a significant change from pre-treatment to one-year follow-up in the intervention group, but not in the control group.
Power et al. ²¹	72 (EMDR = 27, PE + CR = 21, WL = 24) 39 (EMDR = 22, PE + CR = 17)	15 months	No	Significant reductions in PTSD symptoms after treatment in the intervention groups were maintained at follow-up.

Brief = brief treatment; CAPS = clinician-administered PTSD scale; CBT = cognitive-behavioral therapy; CPT = cognitive processing therapy; CR = cognitive restructuring; EMDR = eye movement desensitization and reprocessing; IES-R = impact of events scale; PE = prolonged exposure; PSS = perceived stress scale; PTSD = post-traumatic stress disorder; SIT = stress inoculation training; TAU = treatment as usual; WL = waiting list.

	Randomization	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Description of treatment (or reference)
Asukai 2010	-	-	-	+
Chard 2005	-	-	-	+
Foa 1999	-	-	-	+
Foa 2005	-	-	-	+
Knaevelsrud 2010	-	-	-	+
Mueser 2015	+	?	?	+
Nacasch 2011	+	-	-	+
Power 2002	-	-	-	+

Figure 2 - Risk of bias, individual results: authors' judgement of each type of risk of bias presented as percentages across all included studies.

Although the eight studies identified had originally been designed with a control group obtained through a randomization process, only two of them maintained these groups in the follow-up period. The others continued as open trials. Thus, despite the fact that all studies reported maintenance of therapeutic effect in the follow-up period, the evaluation of the long-term efficacy of CBT in the treatment of PTSD is compromised because of the absence of control groups and rigorous methodological designs able to show evidence of this maintenance after one year of treatment.

Previous meta-analyses have concluded that CBT is effective in the treatment of short-term PTSD, as can be seen in Bradley et al.,²² who investigated the efficacy of psychotherapies in the treatment of PTSD in 10 randomized controlled trials, and also in Sijbrandij et al.,²³ who investigated the effectiveness of CBT in the treatment of PTSD, including only interventions performed over the internet. In both analyses, few studies addressed the follow-up period, again compromising the evaluation of the long-term effects of CBT in the treatment of PTSD. Bradley et al.,²² in their influential meta-analysis, highlighted this gap in the literature: "Perhaps of most concern for applying the empirical literature to clinical practice is the absence of follow-up studies at extended intervals, given that PTSD is generally a disorder of long duration and frequently co-occurs with many other such disorders" (p. 225).

The choice of an ideal control group is not always possible in the real world. Control conditions may threaten the internal validity of a study by overestimating or underestimating the effects of certain psychological treatments.²⁴ The two studies in this review that maintained control groups in the follow-up period made use of distinct comparisons. Nacasch

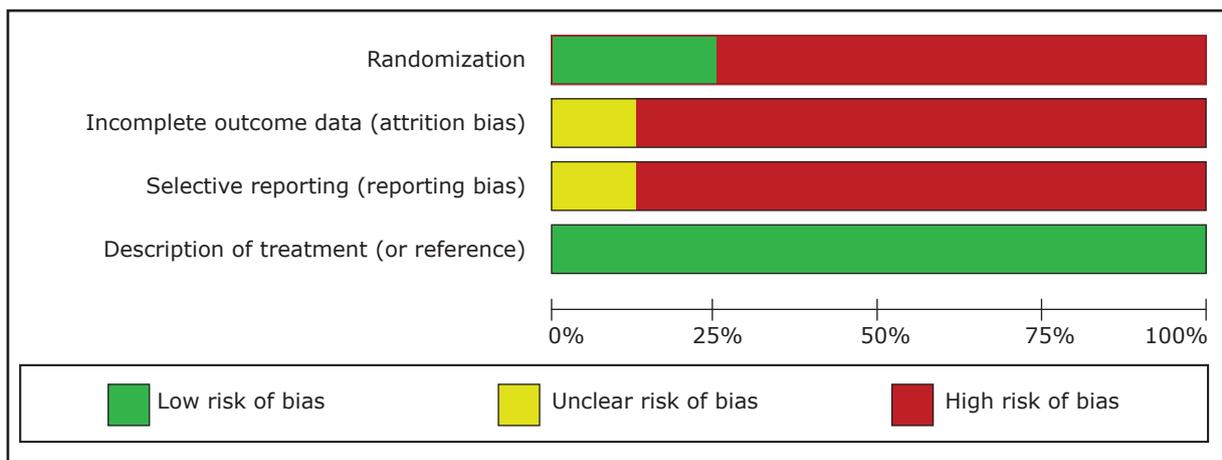


Figure 3 - Risk of bias, summary: authors' judgement of each type of risk of bias for the whole sample.

et al.²⁰ defined TAU as psychodynamic therapy and/or medication or counseling, while Mueser et al.¹⁹ offered the same breathing and psychoeducation training components as in the CBT program, but without cognitive restructuring.

Five of the eight studies used waiting lists as a control group. Therefore, even if these studies had been able to continue the initial randomization to the follow-up period, it would have been necessary to critically evaluate the results. There is a presumption that the absence of treatment is equivalent to the absence of effect. There is evidence that participants placed on waiting lists tend to improve less than people with the same disorder but who do not participate in clinical trials. The waiting list is considered by some authors as a “nocebo” (the opposite of a “placebo”), an inert treatment capable of causing an adverse effect.⁴ According to Mohr et al.,²⁴ a waiting list may be more ethically acceptable when the experimental treatment targets a problem without an indication of treatment, or when the study focuses on a population without immediate risks (e.g., prevention of depression), but may be less ethically acceptable when the trial focuses on serious disorders for which effective treatment is indicated and available.

Only one study¹⁷ reports the rate of relapse after the intervention. Given that PTSD is a chronic, long-lasting disorder,² studies should include not only a longer follow-up (at least greater than 12 months), but also reports on the rate of relapse after the intervention. Thus, the real effects over time as well as the cost-benefit of the interventions could be better evaluated.

There is no data in the literature yet on the relapse and recurrence of PTSD after psychotherapy. In depression, there are some preliminary data evaluating and discussing relapse and recurrence of the disorder.²⁵ Beshai et al.²⁵ state that only a follow-up of 5 to 10 years could establish whether the effects observed after psychotherapy for depression were only an effect of time.

Despite the chronic course of PTSD, a high percentage of patients present spontaneous remission of the disorder even without treatment. In a meta-analysis including 42 trials with a total of 81,642 participants, the rate of spontaneous remission of PTSD was 44% in the assessed follow-up (40 months).²⁶ The authors point out that future research on remission in PTSD should assess different potential factors that may explain the wide variability in PTSD remission, such as social support, which has been shown to have an impact on the development of PTSD and may be relevant in overcoming it. Increased knowledge about these factors may help improve interventions for PTSD prevention and treatment.

Limitations

The present systematic review included only four databases, although those selected are the key ones. In addition, only one review author carried out the selection of the articles; doubts were discussed with the three other authors, and any disagreements were settled by consensus. Also, no experts were contacted to identify unpublished articles.

Conclusion

It is imperative to consider whether a treatment has sustained efficacy. A treatment that produces an initial response or even a response that lasts for about six months after its completion may still not be an effective treatment in a disorder such as PTSD,²² which is often chronic and long-lasting. By mapping the current state of research on maintaining the long-term gains in the treatment of PTSD with CBT we found several factors – particularly related to methodological problems – that severely limit our ability to draw solid conclusions from the findings. The fact that only two of the eight studies included in the present systematic review were randomized in the period of one year follow-up indicate that no firm conclusions can be made about the long-term efficacy of CBT for PTSD. Future randomized studies should follow the recommendations of Bradley et al.²² to avoid relatively inert control and wait-list conditions, and to follow PTSD patients through at least two years using active control groups.

Disclosure

No conflicts of interest declared concerning the publication of this article.

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