



Review

Problem-solving therapy for adult depression: An updated meta-analysis



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ABSTRACT

Background: Problem-solving therapy (PST) is one of the best examined types of psychotherapy for adult depression. No recent meta-analysis has examined the effects of PST compared to control groups or to other treatments. We wanted to verify whether PST is effective, whether effects are comparable to those of other treatments, and whether we could identify the possible sources of high heterogeneity that was found in earlier meta-analyses.

Methods: We conducted systematic searches in bibliographical databases, including PubMed, PsycInfo, Embase and the Cochrane database of randomized trials.

Results: We included 30 randomized controlled trials on PST (with 3530 patients), in which PST was compared to control conditions, with other therapies, and with pharmacotherapy. We could compare these 30 trials on PST also with 259 trials on other psychotherapies for adult depression. The effect size of PST versus control groups was $g = 0.79$ (0.57–1.01) with very high heterogeneity ($I^2 = 84$; 95% CI: 77–88). The effect size from the 9 studies with low risk of bias was $g = 0.34$ (95% CI: 0.22–0.46) with low heterogeneity ($I^2 = 32$; 95% CI: 0–68), which is comparable to the effects of other psychotherapies. PST was a little more effective than other therapies in direct comparisons, but that may be explained by the considerable number of studies with researcher allegiance towards PST. In meta-regression analyses of all controlled studies, no significant difference between PST and other therapies was found.

Conclusion: PST is probably an effective treatment for depression, with effect sizes that are small, but comparable to those found for other psychological treatments of depression.

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1. Introduction

In the past decades dozens of psychological interventions for the treatment of depression have been developed. However, only a relatively small number of these treatments have been tested in ten or more randomized trials. The therapies that have been well-examined include cognitive behavior therapy [1,2], interpersonal psychotherapy [3,4], behavioral activation [5,6], brief psychodynamic therapy [7,8] and non-directive counseling [9]. When considering the several hundreds of randomized controlled and comparative trials that have examined psychotherapies for depression, it has become clear that these therapies have modest but clinically relevant effects [10]. Furthermore, this area of research has shown that there are no major differences between

the effects of these treatments [11], that these treatments can be delivered effectively in individual, group, guided self-help and internet-delivered format [12–14], and that they are effective in several different target groups, such as older adults [15,16], children and adolescents [17], postpartum depression [18], college students [19], and patients with comorbid general medical disorders [20].

One of the interventions that has been tested as a treatment of adult depression in a considerable number of randomized trials is problem-solving therapy (PST). PST was developed in the 1970s as one of the first treatments of depression [21], and was first tested in the 1980s [22,23]. PST focuses on training in adaptive problem-solving attitudes and skills and is aimed at reducing and preventing psychopathology, and at enhancing positive well-being by helping individuals cope more effectively with stressful problems in daily life [24].

A decade ago we conducted a meta-analysis of trials testing the effects of PST for adult depression [25]. The 13 trials that were included in this meta-analysis pointed at a large effect of PST

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versus control groups ($d = 0.83$), and some indications were found that PST was more effective than other therapies, although that was based on a small set of studies. Since this meta-analysis, several other meta-analyses have been published [24,26,27]. However, the last comprehensive meta-analysis aimed at including all trials on PST for depression was published in 2009 [24]. One meta-analysis was published later [27], but that was only aimed at studies among older adults. Because the number of trials on PST has more than doubled since then, a new meta-analysis is much needed. Furthermore, none of the comprehensive meta-analyses examined the effects of the quality of the included trials on the outcomes, nor was publication bias well examined.

Another reason why a new meta-analysis of PST is useful, is that in our first meta-analysis a very high level of heterogeneity was found, indicating that the effect sizes varied strongly across studies [25]. It was not possible to identify possible causes of this heterogeneity in subgroup and meta-regression analyses. It is important, however, to know under which conditions PST has large or small effects. Because the number of trials is now considerably larger than 10 years ago, it may be possible to better identify possible causes of heterogeneity.

We conducted a new meta-analysis of PST for adult depression. We wanted to examine the overall effects of PST, the level of heterogeneity and to conduct subgroup and meta-regression analyses to examine potential causes of this heterogeneity. Furthermore, we wanted to examine the relative effects of PST compared with other psychological therapies. We wanted to examine this from trials directly comparing PST with other therapies, but also by comparing the effects found in trials comparing PST with control groups, with the effects found for other therapies that are compared with control groups.

2. Methods

2.1. Identification and selection of studies

We used an existing database of studies on the psychological treatment of depression. This database has been described in detail elsewhere [28], and has been used in a series of earlier published meta-analyses [29]. For this database we searched four major bibliographical databases (PubMed, PsycInfo, Embase and the Cochrane Library) by combining terms (both index terms and text words) indicative of depression and psychotherapies, with filters for randomized controlled trials. The full search string for one database (PubMed) is given in Appendix A in Supplementary material. We also searched a number of bibliographical databases to identify trials in non-Western countries [30], because the number of trials on psychological treatments in these countries is growing rapidly. Furthermore, we checked the references of earlier meta-analyses on psychological treatments of depression. The database is continuously updated and was developed through a comprehensive literature search (from 1966 to January 1st, 2017). All records were screened by two independent researchers and all papers that could possibly meet inclusion criteria according to one of the researchers were retrieved as full-text. The decision to include or exclude a study in the database was also done by the two independent researchers, and disagreements were solved through discussion.

We included studies that were: (a) a randomized trial (b) in which PST (c) for adult depression was (d) compared with a control group (waiting list, care-as-usual, placebo, other inactive treatment) or another treatment (psychological or pharmacological). Depression could be established with a diagnostic interview or with a score above a cut-off on a self-report measure. Co-morbid mental or somatic disorders were not used as an exclusion

criterion. Studies on inpatients were excluded. We also excluded maintenance studies, aimed at people who had already recovered or partly recovered after an earlier treatment. We considered an intervention to be PST when problem-solving was the core element of the intervention that was meant to reduce depression. Other techniques were allowed when they were aimed at supporting or strengthening the problem-solving element. If other techniques were clearly considered to be separate elements, we did not consider it PST.

In addition to the main analyses in which we focused on the studies on PST, we also wanted to compare the effects of PST with the effects found for other psychological treatments of adult depression. For this comparison we selected trials from our database in which other types of psychotherapy for depression were compared with a control condition, with the same in- and exclusion criteria as for the studies on PST.

2.2. Quality assessment and data extraction

We assessed the validity of included studies using four criteria of the 'Risk of bias' assessment tool, developed by the Cochrane Collaboration [31]. This tool assesses possible sources of bias in randomized trials, including the adequate generation of allocation sequence; the concealment of allocation to conditions; the prevention of knowledge of the allocated intervention (masking of assessors); and dealing with incomplete outcome data (this was assessed as positive when intention-to-treat analyses were conducted, meaning that all randomized patients were included in the analyses). Assessment of the validity of the included studies was conducted by two independent researchers, and disagreements were solved through discussion.

We also coded participant characteristics (depressive disorder of scoring high on a self-rating scale; recruitment method; target group); characteristics of the psychotherapies (treatment format; number of sessions); and general characteristics of the studies (type of control group; country where the study was conducted). Treatment format was coded as individual, group or guided-self help (including internet-based guided self-help).

We distinguished three types of PST [25]: (1) Extended PST, which does not only focus on the problem-solving skills themselves, but also on changing those attitudes or beliefs that may inhibit or interfere with attempts to engage in the remaining problem-solving tasks. It is typically conducted in a group format of 10 or more sessions. We (arguably) considered an intervention as extended PST when it had 10 sessions or more. (2) Brief PST, which was originally developed for primary care (PST-PC), focuses on the core elements of problem-solving and can be used by trained nurses. We considered an intervention as brief PST when it had 9 sessions or less. (3) Self-examination therapy (SET) is aimed at determining the major goals in their life, investing energy only in those problems that are related to what matters and learning to accept those situations that cannot be changed. Problem-solving skills are the core element of this approach. SET is typically used in a guided-self-help format. We considered an intervention as SET when it was based on self-examination therapy [32] and was conducted in guided self-help format.

In the studies comparing PST with other therapies we also examined researcher allegiance, using the methods we have described before [9]. We coded that researcher allegiance was in favor of PST (against the alternative therapy) if: (1) PST was the only therapy mentioned in the title; (2) PST was explicitly mentioned as the main experimental intervention in the introduction section of the study; (3) the alternative therapy was explicitly described as a control condition included to control for the non-

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