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Conflicts of interest and bias in reviews of psychological therapies: A systematic review

Submission to BMJ Open

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Abstract

Objective To explore conflicts of interest (COI) and their reporting in systematic reviews of psychological therapies and to evaluate whether these COI are reflected in biased conclusions of the reviews.

Design Cohort study of systematic Reviews, searched in MEDLINE and PsycINFO.

Methods Databases were searched for systematic reviews that assessed effects of psychological therapies for anxiety, depressive or personality disorders, included at least one randomized controlled trial (RCT) and were published between 2010 and 2013. Required COI disclosure by journal, disclosed COI by review authors and the inclusion of own primary studies by review authors were extracted. Researcher allegiance as well as bias in review conclusions were rated by two independent raters.

Results 936 references were retrieved, and 95 reviews fulfilled eligibility criteria. 59 compared psychological therapies with other forms of psychological therapies, and 36 compared psychological therapies with pharmacological interventions. In total, financial, non-financial, and personal COI were disclosed in 22, 4, and 1 review, respectively. Two of 86 own primary studies of review authors included in 34 reviews were disclosed by review authors. In 15 of the reviews, authors showed an allegiance effect to the evaluated psychological therapy that was never disclosed. Bias in review conclusions was found in 27 of 95 reviews. Reviews with a conclusion in favour of psychological therapies (vs. pharmacological interventions) were at high risk for biased conclusions (OR = 8.31 [1.41 to 49.05]). Bias was explained in trend by the inclusion of own primary studies in the systematic review (OR = 2.08 [CI 0.83 to 5.18] p = .11) and researcher allegiance (OR = 2.63 [0.84 to 8.16] p= 0.16).

Conclusions Non-financial COI, especially the inclusion of own primary studies into reviews and researcher allegiance, are frequently seen in systematic reviews of psychological therapies and need more transparency and better management.

Article summary

Strengths and limitations of this study

- This study addresses a widely neglected research topic, i.e. bias introduced by non-financial conflicts of interest, e.g. the researcher allegiance to a specific therapy, in reviews on psychological therapies.
- Although authors of reviews of psychological therapies frequently show COI (which mainly are not declared), the relationship to bias is less clear and has to be interpreted with caution.
- The selection of studies up to 2013 does not reflect possible changes in COI declarations in recent years. However, the authors are not aware of changes in COI declaration requirements regarding non-financial COI in 2014 or 2015.

Introduction

Conflicts of interest (COI) are defined as a set of circumstances that creates a risk that a professional judgement or action regarding a primary interest will be unduly influenced by a secondary interest[1 2]. Research on COI has so far mainly focused on financial COI such as close financial relationships between researchers or medical doctors and pharmaceutical companies or the financing of drug trials by pharmaceutical companies[3-7]. Such research has shown that studies funded by pharmaceutical companies more often yield results or conclusions in favour of the sponsoring company as compared to non-industry-funded trials [8 9], that close relationships of researchers to pharmaceutical companies are linked to biased assessments of drug safety and efficacy[10 11], that positive trials are more likely to be published than trials unfavourable to sponsors[12], and that COI are underreported in meta-analyses of pharmacological treatments[13 14].

The influence of non-financial COI, however, on the framing of research questions, the data analysis and interpretation of results, or the decision which results are being published, has been much less extensively studied[15]. With respect to outcome research of psychological therapies, researcher allegiance constitutes an important non-financial COI. Allegiance covers the belief of a researcher in the superiority of a treatment[16 17]. Allegiance may be due to a special training in one specific psychological therapy, the involvement in previous efficacy research about this psychological therapy or the involvement in development of etiological models via basic research.[18-20] Empirical studies showed a strong impact of researcher allegiance on outcome in psychotherapy studies: A recent meta-meta-analysis showed a robust and moderate allegiance outcome association (r = .26)[21], and such an association is also present in equally effective treatments[22]. Taking allegiance into account for the explanation of effect differences between two active treatments studies with balanced allegiance for two different treatments show no difference in the effectiveness[23].

Since nothing is known about the extent and nature of non-financial COI in systematic reviews of psychological therapies, the aim of this study was to investigate how often non-

financial COI are present and disclosed in systematic reviews of psychological therapies and to analyze whether these COI increase the risk of biased conclusions of the reviews.

Methods

Search strategy and eligibility criteria of systematic reviews

We searched the MEDLINE and PsycINFO databases for systematic reviews or meta-analyses of randomised controlled trials (RCT) on psychological therapies. Reviews were selected if they fulfilled the following inclusion criteria: 1) Inclusion of psychological therapies to treat patients with anxiety disorders, personality disorders and/or major depressive disorders in adults, 2) Active control groups with either other forms of psychological therapy or pharmacological interventions, 3) Inclusion of at least one randomised study, 4) English language. Searches were last run on February 3rd 2014, covering the publication period of January 2010 to December 2013. For exact MEDLINE and PsycINFO search strategies, confer supplement tables 1 and 2.

Screening and inclusion of systematic reviews and primary studies

Retrieved references were initially screened for inclusion by title and abstract by two independent researchers. In a second step, full texts of relevant reviews were retrieved and assessed for inclusion by two independent researchers. These reviews were used to rate conflicts of interest and their disclosure (see below).

Primary studies included in these reviews were identified from the reference list of the systematic reviews and retrieved if one of the co-authors of the review was an author of the respective primary study. These primary studies were then used to rate researcher allegiance (see below).

Assessment of disclosed and undisclosed COI

All disclosed COI were extracted: financial COI (honoraria e.g. for consulting, lectures, scientific articles, training courses or money for research projects), non-financial COI (e.g. researcher allegiance to a psychological therapy, special qualification in a psychological therapy, enthusiasm for a psychological therapy in scientific publications, lectures and research, or inclusion of own primary studies in reviews), and personal COI (e.g. employee or private relationship to an employee of a company - regularly addressed as relationships to pharmaceutical companies). If no COI was reported, the websites of the respective journals as well as the guidelines for authors were screened for requirements of COI disclosures at the time of the publication of the review. In addition, we assessed whether review authors included own studies on psychological therapies into their review and whether this inclusion was disclosed.

Rating of researcher allegiance

In case that a review author included at least one own primary study (which he or she co-authored) into the review, we retrieved these primary studies and rated the researcher allegiance according to information presented in the primary study (note that a rating of researcher allegiance was not possible in the reviews since these do not provide essential information to rate researcher allegiance according to established standards.[18-20]). Researcher allegiance was rated in 73 of the 86 included primary studies since 13 reviews did not compare psychological therapies to other treatments and were therefore excluded.

Researcher allegiance was defined to be present, if the author a) recommended the respective psychological therapy over another therapy and was b) either involved in the development of the respective psychological therapy or c) was involved in research of/development of the etiological model of the psychological therapy. Two independent researchers (JOS, JB) assessed allegiance in the primary studies and disagreements were resolved with a third rater (KL). If researcher allegiance was rated to be present in at least one of the primary studies included in a review, this review was rated as afflicted by researcher allegiance. Kappa statistics showed substantial inter-rater reliability (k = 0.62; agreement 82%).

Assessment of bias in reviews

To assess bias (or "spin") in review conclusions, we evaluated whether the conclusion of the review as expressed in the abstract or the discussion section was inconsistent or consistent to the empirical results described in the results section of the review. If the conclusion was consistent with the empirical results, the review was considered as unbiased. If it was inconsistent, the review was rated as biased. Two researchers (KL, JOS) independently assessed review conclusions and results and rated the review as biased or unbiased. If no consensus was achieved, disagreements were resolved by a third person (JB). Kappa statistics showed substantial inter-rater reliability (k = 0.70; agreement 87%).

Statistical analyses

The percentage of disclosed COI, researcher allegiance and biased reviews was calculated. For the first two indicators, the number of reviews was the denominator, the latter indicator was calculated with the number of studies as denominator. The association of researcher allegiance with a biased conclusion of reviews is presented as Odds ratio with 95% confidence interval. The same procedure was used for the association of the inclusion of own primary studies of the authors in the review and the disclosure of COI with a biased review.

Results

Our search yielded 936 references. After screening and retrieving full text articles, 95 reviews remained which met our inclusion criteria. A detailed flow chart with a schedule of the reasons for exclusions is found in Figure 1. The reviews and meta-analyses addressed anxiety disorders (n = 42), depressive disorders (n = 48), and/or personality disorders (n = 13) and allowed conclusions about the following interventions: 59 reviews compared psychological therapies

with other forms of psychological therapies, and 36 compared psychological therapies with pharmacological interventions.

Required COI disclosure by journal and disclosed COI

The references of the 95 reviews included in this study are listed in Supplement Table 3. Supplement Table 4 gives an overview how many reviews were published per year in which journal. 40 of the 50 journals regularly requested a disclosure of COI at the time of publication of the respective review. Supplement Table 5 demonstrates which journal asked for which kind of COI disclosure in the respective year of publication of the review article. In sum: Of the 50 publishing journals, 40 requested a disclosure of financial COI (80%), 28 of personal COI (56%), and 17 of non-financial COI (34%).

In 37 of 95 reviews (38.9%), the authors disclosed that no competing interests exist. Authors in 25 of 95 reviews (26.3%) made COI statements as follows: Own study included in the review (n = 2), research activities in relation to one psychological therapy (n = 2), research support (n = 18), author has served as consultant (n = 4), served as speaker on congresses (n = 1), get honoraria (n = 5), have holdings (n = 2), have patents (n = 1), served as a trainer for a psychological therapy (n = 1), being influenced as employer (n = 1). In other words, financial, non-financial, and personal COI were disclosed in 22 reviews (23.1%), 4 reviews (4.2%), and 1 review (1%), respectively. In 33 of 95 reviews (34.7%) no COI statement was made.

Inclusion of own studies into the reviews and researcher allegiance

We also looked at the frequency of the inclusion of own primary studies into the review and the allegiance of the researcher. 34 of 95 reviews (35.8%) included at least one primary study of one of the review authors. In sum, 86 primary studies were identified which were included in 34 reviews (see Supplement Table 6 for references of these included studies). 20 reviews included 1 study, 4 reviews 6 studies, 4 reviews 3 studies, 4 reviews 2 studies, 1 review 4 studies and 1 review 18 studies. In 15 of the 34 reviews which included at least one own primary study, we found a researcher allegiance.

Two reviews disclosed that they included studies of review authors in their review (2.1%). In none of the reviews any involvement of an author in the development of a psychological therapy under study was disclosed. Also the conduct of experimental studies about the etiological model of a psychological therapy or the recommendation for a certain reason was never disclosed.

Bias in reviews

Bias in the interpretation of review results was rated to be present in 27 of 95 reviews (28%). Within the 36 reviews comparing psychological therapies to pharmacological interventions, 9 (25%) were biased. In reviews comparing psychological therapies and pharmacological interventions, bias in favour of a specific psychological therapy was more often present as compared to bias in favour of a pharmacological intervention (Fig. 2). Reviews with a favourable conclusion about psychological therapies (vs. pharmacological interventions) are at high risk for biased conclusions (OR = 8.31 [1.41 to 49.05]), whereas favourable conclusions about effects of pharmacological interventions were not biased in our sample (OR = 1.00 [0.16 to 6.14]. Also the conclusion of equal effects of psychological therapies and pharmacological interventions does not face a risk to be biased (OR = 0.12 [0.01 to 1.08]. The conclusion of the equality of effects of psychological therapies, however, is at risk to be biased (trend), which means that for the primary outcome of interest the review more often states equality despite inequality of treatment effects (OR = 2.69 [0.86 to8.41].

We further explored whether bias in review conclusions is associated with a disclosed COI, the inclusion of own primary studies of the authors or the researcher allegiance of the authors. To do so, we first investigated these associations in all 95 reviews (Tab. 1). Biased conclusions were not explained by disclosed COI. However, biased conclusions were explained in trend by the inclusion of own studies in the systematic review. Reviews with inclusion of own primary studies were more often biased than reviews without inclusion of own primary studies of the review authors (OR = 2.08 [CI 0.83 to 5.18] p = .11; Tab. 1). The odds for biased conclusions in systematic reviews including studies with researcher allegiance was similarly increased, but

statistically non-significant (OR = 2.63 [0.84 to 8.12], p = .16; Tab. 1).

Since we were especially interested in bias in favour of psychological therapies, we also investigated whether bias in review conclusions in favour of psychological therapies is associated with a disclosed COI, the inclusion of own primary studies of the authors or the researcher allegiance of the authors (Tab. 2). However, none of the associations were statistically significant or showed trends.

Discussion

This study is – at least to our knowledge - the first that systematically assessed the extent and nature of reporting of financial and non-financial COI in systematic reviews of psychological therapies and that investigated how often these conflicts are disclosed and whether they may lead to bias in review conclusions. Financial and non-financial COI were disclosed only in 23.1% and 4.2% of the reviews, respectively, although non-financial COI were much more often detectable: Review authors had included 86 own studies in approximately 1/3rd of the reviews and authors of at least 16% of the reviews had allegiance for the evaluated psychological therapy. Bias in review conclusions was found in 27 of 95 reviews (28%) and was explained in trend by a non-financial COI, i.e. the inclusion of own primary studies in the systematic review.

Disclosure of financial, non-financial and personal COI

The disclosure of financial COI was requested by 80% of the journals which published the reviews in our study, but only 22 reviews (23.2%) disclosed any financial COI. This may be explained by two reasons: Firstly, systematic reviews focussing on effectiveness of psychological therapies are most often written by psychologists who have rather seldom financial ties to pharmaceutical companies as compared to physicians who often show these relationships[3-7], and secondly, the minority of reviews (36 of 95 reviews) compared

psychological therapies to pharmacological interventions (in 10 of those reviews, financial COI were disclosed). Although psychologists may mostly judge themselves as free of financial COI, however, researcher allegiance as well as the inclusion of own studies into a review (which we both rated as non-financial COI) may well lead to financial gains indirectly.[15] Since psychologists who develop new psychological treatments are often the ones who distribute and train other psychologists in those therapies, the demonstration of effectiveness of a specific psychotherapy in a review may potentially lead to high financial incentives. The promotion of the respective therapy might be easier and the number of trained psychotherapists with high course fee increases. Showing the effectiveness of a treatment can be also an important step for patents and for the implementation in treatment guidelines.

Non-financial COI were disclosed only in a very small number of reviews (4.2%) although non-financial COI such as the inclusion of own primary studies of the review authors (in 34 of 95 reviews) and researcher allegiance (in 15 of 95 reviews) were detectable in a considerable number of them. This low disclosure rate may be explained by three factors: Firstly, only a minority of journals (34% at the time of assessment) requests a disclosure of non-financial COI; secondly, only two journals (Perm J, Cochrane Database Syst Rev) specifically asked the authors for the inclusion of own primary studies and only two others (Psychol Trauma, J Psychiatr Res) asked for circumstances related to the presence of researcher allegiance at the point of our assessment; thirdly, researchers may not see the necessity to declare such COI although present and requested to be disclosed by the journal, which we have seen in one review article. We conclude from this finding that the necessity to declare non-financial COI should be made more transparent in journal articles. The following strategies may be effective: Journals should consequently ask their authors to disclose any non-financial COI, should exactly define such conflicts and should include examples of common causes of non-financial COI such as the inclusion of own primary studies into review articles or researcher allegiance. Even the prestigious INTERNATIONAL COMMITTEE OF MEDICAL JOURNAL EDITORS (ICMJE) mainly focusses on financial COI and their disclosure but gives little emphasis on and advice to the disclosure of non-financial COI.

Similar to non-financial COI, also personal COI were very seldom disclosed (only in one review). This is probably due to the common definition of personal COI meaning any relationship to a person working in a pharmaceutical company. This of course is a less relevant COI for psychotherapist assessing treatment effects of psychological therapies. However, psychotherapists, especially the ones who develop new therapies, are very often personally involved in institutes promoting the distribution and training of new psychological therapies. Such personal COI may indirectly lead to considerable financial gains.

Bias in review conclusions

Previous research of our group and others has identified different risks increasing the likelihood of bias in psychotherapeutic outcome research.[21 24] In our study, we investigated whether researcher allegiance, an important risk factor of moderate effect size[21], the inclusion of own primary studies into the review or any declared COI may explain bias, which we found in 27 of the 95 reviews. Both reviews with inclusion of own primary studies and reviews with researcher allegiance were more often biased (statistical trend). Since researcher allegiance has been shown to be significantly related to outcome of psychological therapies[21], authors should be transparent in disclosing their own psychotherapeutic training background and the inclusion of own outcome studies in systematic reviews to make an assessment of COI and allegiance easier. The allegiance indicators of our study might be an initial step for such a statement (development of treatment or basic research on the etiological model for a specific treatment).

Shortcomings

This study has several shortcomings. Firstly, we restricted our search to systematic reviews and meta-analyses of anxiety disorders, personality disorders and major depressive disorders. This may limit the generalizability of our findings. Secondly, our study is limited to published reports from 2010 onwards. This limits generalizability to earlier reviews, but is justified since COI reporting has become more regular nowadays and authors might not have been asked for a COI statement in earlier submissions. Thirdly, our indicators of COI and allegiance are based on

publications and reporting quality on some indicators was rather low. The inter-rater reliability of both ratings might be much better if reporting standards in journals would be implemented.

Conclusions

We conclude that non-financial COI, especially the inclusion of own primary studies into reviews and researcher allegiance, are frequently seen in systematic reviews of psychological therapies and need more transparency. If biasing effects of non-financial COI in psychotherapy outcome research are confirmed in further studies, journals should do more than simply providing transparency of COI in order to better manage the impact of COI on research outcomes and publications [15]. One such strategy to be considered might be the exclusion of studies from authors in reviews evaluating the effectiveness of a certain psychological therapy on which the author has published key studies and/or for which he or she shows a researcher allegiance in sensitivity analyses.

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Contributorship statement

KL designed the study, analysed data, monitored study extraction, data analysis and interpretation, and drafted and revised the paper. He is guarantor. JOS and NR extracted and analysed data and revised the draft of the manuscript, JSW analysed data and revised the draft of the manuscript. JB analysed data, monitored study extraction, data analysis and interpretation, and revised the paper. All authors gave final approval of the version to be published. All authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Transparency declaration

The guarantor affirms that the manuscript is an honest, accurate, and transparent account of the study being reported and that no important aspects of the study have been omitted.

Declaration of competing interests

All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: no support from any organisation for the submitted work; KL and JB are active in research on conflicts of interest in medicine and psychology, and JB was involved in the development of indicators of allegiance. All authors declare that they had no financial or personal relationships with pharmaceutical companies within the last 3 years. KL, NR, JSW and JB are psychotherapists trained in CBT, KL and NR also in schematherapy. NR and JB, but not KL and JSW, did receive money from institutes providing training in schematherapy and CBT within the last three years. JSW and KL are coauthors on two reviews included into the study (Gibbon et al., 2010 and Stoffers et al., 2012), and NR and KL are coauthors on one primary study (Reiss et al., 2014) included in one of the reviews.

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Data sharing statement

Extra data is available by emailing Klaus.lieb@unimedizin-mainz.de.

References

1. Thompson DF. The Challenge of Conflict of Interest in Medicine. Z Evid Fortbild Qual Gesundhwes 2009;**103**(3):136-40.
2. Lo B, Fields (ed.) *Conflict of Interest in Medical Research, Education, and Practice*, Institute of Medicine 2009.
3. Campbell EG. Doctors and drug companies - scrutinizing influential relationships. N Engl J Med 2007;**357**(18):1796-7.
4. Campbell EG, Rao SR, DesRoches CM, et al. Physician professionalism and changes in physician-industry relationships from 2004 to 2009. Arch Intern Med 2010;**170**(20):1820-6.
5. Campbell EG, Weissman JS, Ehringhaus S, et al. Institutional academic industry relationships. JAMA 2007;**298**(15):1779-86.
6. Lieb K, Brandtönies S. A survey of german physicians in private practice about contacts with pharmaceutical sales representatives. Dt Arztebl Int 2010;**107**(22):392.
7. Lieb K, Scheurich A. Contact between Doctors and the Pharmaceutical Industry, Their Perceptions, and the Effects on Prescribing Habits. PloS one 2014;**9**(10):e110130.
8. Bekelman JE, Li Y, Gross CP. Scope and impact of financial conflicts of interest in biomedical research: a systematic review. JAMA 2003;**289**(4):454-65.
9. Schott G, Pachl H, Limbach U, et al. The financing of drug trials by pharmaceutical companies and its consequences. Part 1: a qualitative, systematic review of the literature on possible influences on the findings, protocols, and quality of drug trials. Dt Arztebl Int 2010;**107**(16):279-85.
10. Wang AT, McCoy CP, Murad MH, et al. Association between industry affiliation and position on cardiovascular risk with rosiglitazone: cross sectional systematic review. BMJ 2010;**340**:c1344.
11. Dunn AG, Arachi D, Hudgins J, et al. Financial conflicts of interest and conclusions about neuraminidase inhibitors for influenza: an analysis of systematic reviews. Ann Intern Med 2014;**161**(7):513-8.
12. Roest AM, de Jonge P, Williams CD, et al. Reporting Bias in Clinical Trials Investigating the Efficacy of Second-Generation Antidepressants in the Treatment of Anxiety Disorders: A Report of 2 Meta-analyses. JAMA psychiatry 2015;**72**(5):500-10.
13. Roseman M, Milette K, Bero LA, et al. Reporting of conflicts of interest in meta-analyses of trials of pharmacological treatments. JAMA 2011;**305**(10):1008-17.
14. Roseman M, Turner EH, Lexchin J, et al. Reporting of conflicts of interest from drug trials in Cochrane reviews: cross sectional study. BMJ 2012;**345**:e5155.
15. Clark AM, Choby A, Ainsworth K, et al. Addressing conflict of interest in non-pharmacological research. Int J Clin Pract. 2015;**69**(3):270-2.
16. Leykin Y, DeRubeis RJ. Allegiance in Psychotherapy Outcome Research: Separating Association From Bias. 2009.
17. Lambert MJ. Are differential treatment effects inflated by researcher therapy allegiance? Could Clever Hans count? Clinical Psychology: Science and Practice 1999;**6**(1):127-30.
18. Gaffan EA, Tsaousis I, Kemp-Wheeler SM. Researcher allegiance and meta-analysis: the case of cognitive therapy for depression. J Consult Clin Psychol. 1995;**63**(6):966-80.
19. Munder T, Gerger H, Trelle S, et al. Testing the allegiance bias hypothesis: a meta-analysis. Psychother Res 2011;**21**(6):670-84.
20. Miller S, Wampold B, Varhely K. Direct comparisons of treatment modalities for youth disorders: a meta-analysis. Psychother Res 2008;**18**(1):5-14.
21. Munder T, Brutsch O, Leonhart R, et al. Researcher allegiance in psychotherapy outcome research: an overview of reviews. Clin Psychol Rev 2013;**33**(4):501-11.

22. Munder T, Fluckiger C, Gerger H, et al. Is the allegiance effect an epiphenomenon of true efficacy differences between treatments? a meta-analysis. J Couns Psychol 2012;**59**(4):631-7.
23. Cuijpers P, Driessen E, Hollon SD, et al. The efficacy of non-directive supportive therapy for adult depression: a meta-analysis. Clin Psychol Rev 2012;**32**(4):280-91.
24. Cuijpers P, van Straten A, Bohlmeijer E, et al. The effects of psychotherapy for adult depression are overestimated: a meta-analysis of study quality and effect size. Psychol Med 2010;**40**(2):211-23.

Figures

Figure 1: Flow chart of study selection

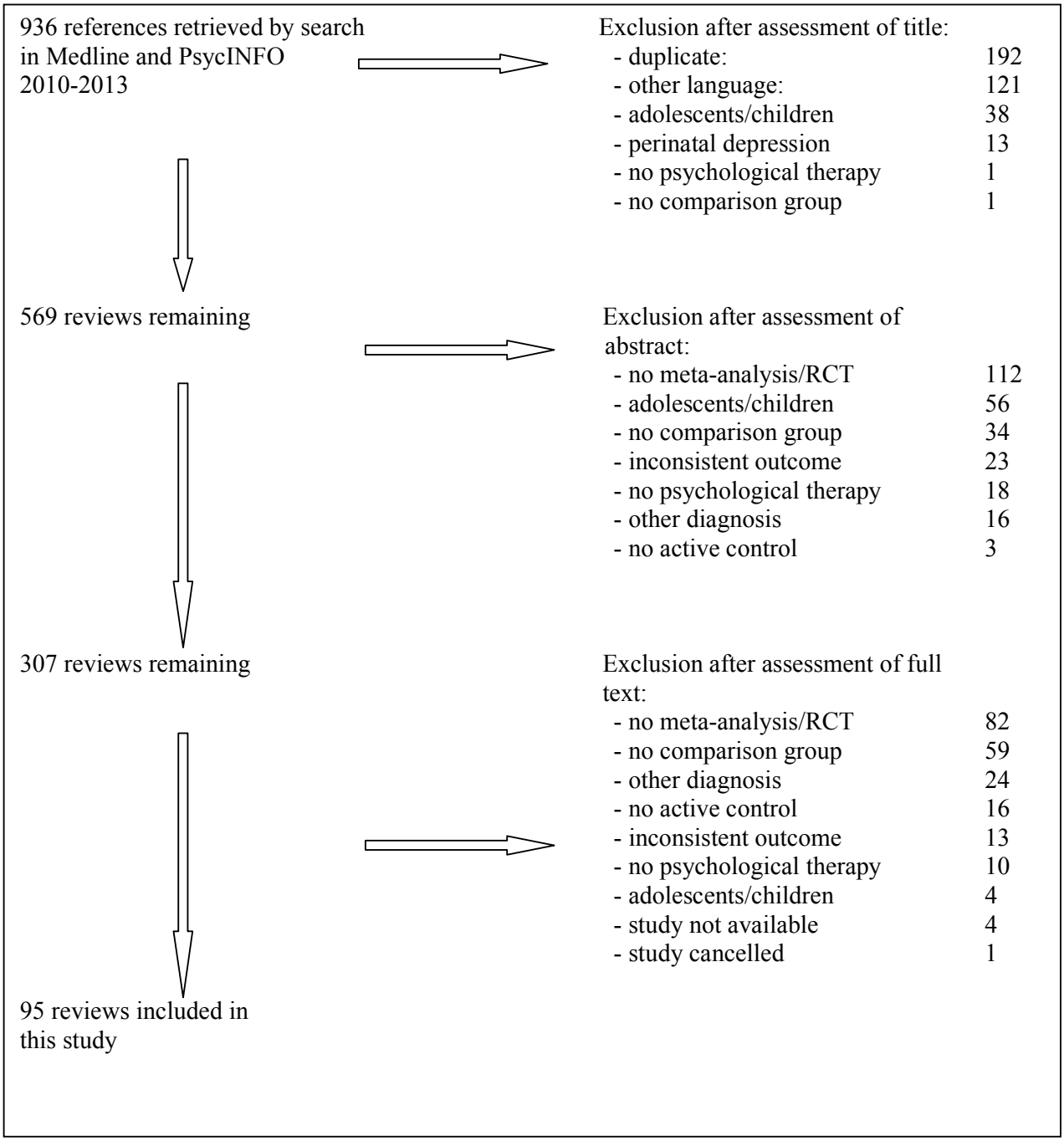
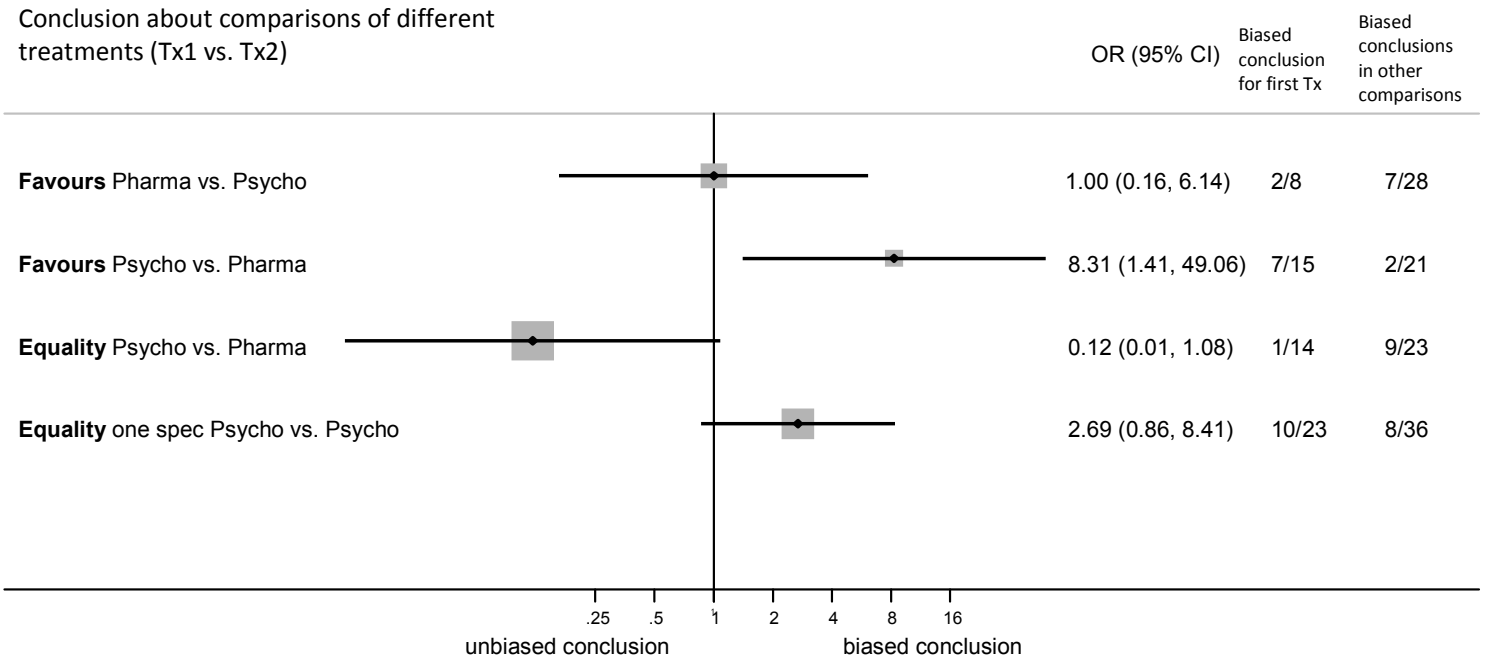


Figure 2: Risk of bias in conclusions in comparisons of different treatments (Tx1 vs. Tx2).



Tables

Tab. 1 Association between disclosed COI and other forms of COI (i.e. inclusion of primary studies in reviews, researcher allegiance) and bias in review conclusions in all 95 reviews.

	Review with biased conclusion	Review with unbiased conclusion	Odds Ratio [95% confidence interval]
Inclusion of own primary study	13	21	2.08 [0.83 to 5.18]
No inclusion of own primary study	14	47	
Researcher allegiance	7	8	2.63 [0.84 to 8.16]
No researcher allegiance	20	60	
COI disclosed	9	16	1.63 [0.61 to 4.32]
No COI disclosed	18	52	
Inclusion of own primary study, researcher allegiance and/or COI declared	16	31	1.74 [0.70 to 4.29]
None of the three	11	37	

Tab. 2: Association between disclosed COI and other forms of COI (i.e. inclusion of primary studies in reviews, researcher allegiance) and bias in review conclusions in the reviews rated as biased in favour of psychological therapies as compared to all other reviews.

	Review rated as "biased" in favour of psychological therapies	Review rated as "unbiased" or "biased" against psychological therapies	Odds Ratio [95% confidence interval]
Inclusion of own primary study	6	28	1.24 [0.40 to 3.83]
No inclusion of own primary study	9	52	
Researcher allegiance	2	13	0.79 [0.16 to 3.94]
No researcher allegiance	13	67	
COI disclosed	4	21	1.02 [0.29 to 3.56]
No COI disclosed	11	59	
Inclusion of own primary study, researcher allegiance and/or COI disclosed	7	40	0.88 [0.29 to 2.64]
None of the three	8	40	

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Supplements

Supplement Table 1: MEDLINE EBSCO exact search strategy (last run on February 3rd, 2014)

#	
S1	(MH "Psychotherapy+")
S2	(MH "Anxiety Disorders+")*
S3	(S1 AND S2)
S4	(S1 AND S2) – Date of publication: 20100101-20131231; Publication Type: Meta-Analysis, Review

* This search is exemplary for anxiety disorders. Separate searches were done for depressive and personality disorders, using controlled vocabulary (MH "Depressive Disorders+") or (MH "Personality Disorders+"), resp.

Supplement Table 2: PsycINFO EBSCO exact search strategy (last run on February 3rd, 2014)

#	
S1	DE "Psychotherapy" OR DE "Adlerian Psychotherapy" OR DE "Adolescent Psychotherapy" OR DE "Analytical Psychotherapy" OR DE "Autogenic Training" OR DE "Behavior Therapy" OR DE "Brief Psychotherapy" OR DE "Brief Relational Therapy" OR DE "Child Psychotherapy" OR DE "Client Centered Therapy" OR DE "Cognitive Behavior Therapy" OR DE "Conversion Therapy" OR DE "Eclectic Psychotherapy" OR DE "Emotion Focused Therapy" OR DE "Existential Therapy" OR DE "Experiential Psychotherapy" OR DE "Expressive Psychotherapy" OR DE "Eye Movement Desensitization Therapy" OR DE "Feminist Therapy" OR DE "Geriatric Psychotherapy" OR DE "Gestalt Therapy" OR DE "Group Psychotherapy" OR DE "Guided Imagery" OR DE "Humanistic Psychotherapy" OR DE "Hypnotherapy" OR DE "Individual Psychotherapy" OR DE "Insight Therapy" OR DE "Integrative Psychotherapy" OR DE "Interpersonal Psychotherapy" OR DE "Logotherapy" OR DE "Narrative Therapy" OR DE "Network Therapy" OR DE "Persuasion Therapy" OR DE "Primal Therapy" OR DE "Psychoanalysis" OR DE "Psychodrama" OR DE "Psychodynamic Psychotherapy" OR DE "Psychotherapeutic Counseling" OR DE "Rational Emotive Behavior Therapy" OR DE "Reality Therapy" OR DE "Relationship Therapy" OR DE "Solution Focused Therapy" OR DE "Supportive Psychotherapy" OR DE "Transactional Analysis"
S2	DE "Anxiety Disorders" OR DE "Acute Stress Disorder" OR DE "Castration Anxiety" OR DE "Death Anxiety" OR DE "Generalized Anxiety Disorder" OR DE "Obsessive Compulsive Disorder" OR DE "Panic Disorder" OR DE "Phobias" OR DE "Posttraumatic Stress Disorder" OR DE "Separation Anxiety"
S3	(S1 AND S2)
S4	(S1 AND S2) – Published date: 20100101-20131231; Methodology: -Systematic Review, -Meta Analysis

* This search is exemplary for anxiety disorders. Separate searches were done for depressive and personality disorders, using controlled vocabulary (DE "Major Depression" OR DE "Anaclitic Depression" OR DE "Dysthymic Disorder" OR DE "Endogenous Depression" OR DE "Postpartum Depression" OR DE "Reactive Depression" OR DE "Recurrent Depression" OR DE "Treatment Resistant Depression") or (DE "Personality Disorders" OR DE "Antisocial Personality Disorder" OR DE "Avoidant Personality Disorder" OR DE "Borderline Personality Disorder" OR DE "Dependent Personality Disorder" OR DE "Histrionic Personality Disorder" OR DE "Narcissistic Personality Disorder" OR DE "Obsessive Compulsive Personality Disorder" OR DE "Paranoid Personality Disorder" OR DE "Passive Aggressive Personality Disorder" OR DE "Sadomasochistic Personality" OR DE "Schizoid Personality Disorder" OR DE "Schizotypal Personality Disorder"), resp.

Supplement Table 3: References of the 95 reviews included in this study

Abbass A, Town J, Driessen E. Intensive short-term dynamic psychotherapy: A systematic review and meta-analysis of outcome research. Harv Rev Psychiatry 2012;20(2):97-108.

Abbass A, Town J, Driessen E. The efficacy of short-term psychodynamic psychotherapy for depressive disorders with comorbid personality disorder. Psychiatry 2011;74(1):58-71.

Baardseth TP, Goldberg SB, Pace BT, et al. Cognitive-behavioral therapy versus other therapies: Redux. Clin Psychol Rev 2013;33(3):395-405.

Barker-Collo S, Starkey N, Theadom A. Trearment for depression following mild traumatic brain injury in adults: A meta-analysis. Brain Inj 2013;27(10):1124-1133.

Bartley CA, Hay M, Bloch MH. Meta-analysis: Aerobic exercise for the treatment of anxiety disorders. Prog Neuropsychopharmacol Biol Psychiatry 2013;45:34-39.

Barrera TL, Mott JM, Hofstein RF, et al. A meta-analytic review of exposure in group cognitive behavioral therapy for posttraumatic stress disorder. Clin Psychol Rev 2013;33(1):24-32.

Beltman MW, Oude Voshaar RC, Speckens AE. Cognitive-behavioural therapy for depression in people with a somatic disease: meta-analysis of randomized controlled trials. Br J Psychiatry 2010;197(1):11-19.

Bomyea J, Lang AJ. Emerging interventions for PTSD: Future directions for clinical care and research Neuropharmacology 2012;62:607-616.

Bontempo A, Panza KE, Bloch MH. Meta-Analysis: D-cycloserine Augmentation of Behavioral Therapy for the Treatment of Anxiety Disorders. J Clin Psychiatry 2012;73(4):533–537.

Budge SL, Moore JT, Del Re AC, et al. The effectiveness of evidence-based treatments for personality disorders when comparing treatment-as-usual and bona fide treatments. Clin Psychol Rev 2013;33:1057–1066.

Busch FN, Sandberg LS. Combined treatment of depression
Psychiatr Clin North Am 2012;35:165-179.

Casement MD, Swanson LM. A meta-analysis of imagery rehearsal for post-trauma nightmares: Effects on nightmare frequency, sleep quality, and posttraumatic stress. Clin Psychol Rev 2012;32:566–574.

Chard KM, Ricksecker EG, Healy ET, et al. Dissemination and experience with cognitive processing therapy. J Rehabil Res Dev 2012;49(5):667-78.

Chen KW, Berger CC, Manheimer E, et al. Meditative therapies for reducing anxiety: A systematic review and meta-analysis of randomized controlled trials. Dedress Anxiety 2012;29:545–562.

Chugh-Gupta N, Baldassarre FG, Vrkljan BH. A systematic review of yoga for state anxiety: Considerations for occupational therapy. Can J Occup Ther 2013;80(3):150-170.

Cody RA, Drysdale K. The Effects of Psychotherapy on Reducing Depression in Residential Aged Care: A Meta-Analytic Review. Clin Gerontol 2013;36(1):46-69.

Cuijpers P, Andersson G, Donker T, et al. Psychological treatment of depression: Results of a series of meta-analyses Nord J Psychiatry 2011;65(6):354-364.

Cuijpers P, Berking M, Andersson G, et al. A Meta-Analysis of Cognitive-Behavioral Therapy for Adult Depression, Alone and in Comparison With Other Treatments. Can J Psychiatry 2013;58(7):376-385.

Cuijpers P, Clignet F, van Meijel B, et al. Psychological treatment of depression in inpatients: a systematic review and meta-analysis. Clin Psychol Rev 2011;31(3):353-360.

Cuijpers P, de Beurs DP, van Spijker BA, et al. The effects of psychotherapy for adult depression on suicidality and hopelessness: A systematic review and meta-analysis. J Affect Disord 2013;144(3):183-190.

Cuijpers P, Driessen E, Hollon SD, et al. The efficacy of non-directive supportive therapy for adult depression: A meta-analysis. Clin Psychol Rev 2012;32:280–291.

Cuijpers P, Geraedts AS, van Oppen P, et al. Interpersonal Psychotherapy for Depression: A Meta-Analysis. Am J Psychiatry 2011;168:581–592.

Cuijpers P, Huibers M, Ebert DD, et al. How much psychotherapy is needed to treat depression? A metaregression analysis. J Affect Disord 2013;149(1-3):1-13.

Cuijpers P, Reynolds III CF, Donker T, et al. Personalized treatment of adult depression: Medication, psychotherapy, or both? A systematic review. Depress Anxiety 2012;29:855–864.

Cuijpers P, van Straten A, Hollon SD, et al. The contribution of active medication to combined treatments of psychotherapy and pharmacotherapy for adult depression: a meta-analysis Acta Psychiatr Scand 2010;121:415–423.

Cuijpers P, van Straten A, Schuurman J, et al. Psychotherapy for chronic major depression and dysthymia: A meta-analysis Clin Psychol Rev 2010;30:51–62.

Daigle MS, Pouliot L, Chagnon F, et al. Suicide attemps: Prevention of repetition. Can J Psychiatry 2011;56(10):621-629.

Dickens C, Cherrington A, Adeyemi I, et al. Characteristics of Psychological Interventions That Improve Depression in People With Coronary Heart Disease: A Systematic Review and Meta-Regression. Psychosom Med 2013;75:211-221.

Dossa NI, Hatem M. Cognitive-Behavioral Therapy versus Other PTSD Psychotherapies as Treatment for Women Victims of War-Related Violence: A Systematic Review. Scientific World Journal 2012;2012:181847. doi:10.1100/2012/181847. Epub 2012 Apr 19.

Driessen E, Cuijpers P, de Maat SCM, et al. The efficacy of short-term psychodynamic psychotherapy depression: a meta-analysis. Clin Psychol Rev 2010;30(1):25-36.

Ekers D, Webster LAD. An overview of the effectiveness of psychological therapy for depression and stepped care service delivery models. J Res Nurs 2013;18(2):171-184,

Faller H, Schuler M, Richard M, et al. Effects of psycho-oncologic interventions on emotional distress and quality of life in adult patients with cancer: systematic review and meta-analysis. J Clin Oncol 2013;31(6):782-93.

Feng CY, Chu H, Chen CH, et al. The Effect of Cognitive Behavioral Group Therapy for Depression: A Meta-Analysis 2000–2010. Worldviews Evid Based Nurs 2012;9(1):2-17.

Fritzsche A, Clamor A, von Leupoldt A. Effects of medical and psychological treatment of depression in patients with COPD e A review Respir Med 2011;105:1422-1433.

Gibbon S, Duggan C, Stoffers J, et al. Psychological interventions for antisocial personality disorder. Cochrane Database Syst Rev 2010;6: CD007668. doi:10.1002/14651858.CD007668.pub2.

Goncalves DC, Byrne GJ. Interventions for generalized anxiety disorder in older adults: Systematic review and meta-analysis J Anxiety Disord 2012;26:1–11.

Goodson J, Helstrom A, Halpern JM, et al. Treatment of posttraumatic stress disorder in US combat veterans: a meta-analytic review. Psychol Rep 2011;109(2):573-599.

Gould RL, Coulson MC, Howard RJ. Efficacy of Cognitive Behavioral Therapy for Anxiety Disorders in Older People: A Meta-Analysis and Meta-Regression of Randomized Controlled Trials. J Am Geriatr Soc 2012;60(2):218-29. DOI: 10.1111/j.1532-5415.2011.03824.xJAGS 60:218–229, 2012.

Guidi J, Fava GA, Fava M, et al. Efficacy of the sequential integration of psychotherapy and pharmacotherapy in major depressive disorder: a preliminary meta-analysis. Psychol Med 2011;41:321–331.

Gwozdziewycz N, Mehl-Madrona L. Meta-analysis of the use of narrative exposure therapy for the effects of trauma among refugee populations. Perm J 2013;17(1):70-76.

Hanrahan F, Field AP, Jones FW, et al. A meta-analysis of cognitive therapy for worry in generalized anxiety disorder. Clin Psychol Rev 2013;33(1):120-32.

Hans E, Hiller W. Effectiveness of and Dropout From Outpatient Cognitive Behavioral Therapy for Adult Unipolar Depression: A Meta-Analysis of Nonrandomized Effectiveness Studies. J Consult Clin Psychol 2013;81(1):75•88.

Hansen K, Höfling V, Kröner-Borowik T, et al. Efficacy of psychological interventions aiming to reduce chronic nightmares: a meta-analysis. Clin Psychol Rev 2013;33(1):146-55.

Hart SL, Hoyt MA, Diefenbach M, et al. Meta-Analysis of Efficacy of Interventions for Elevated Depressive Symptoms in Adults Diagnosed With Cancer. J Natl Cancer Inst 2012;104:990–1004.

Haug T, Nordgreen T, Öst LG, et al. Self-help treatment of anxiety disorders: A meta-analysis and meta-regression of effects and potential moderators Clin Psychol Rev 2012;32:425–445.

Hetrick SE, Purcell R, Garner B, et al. Combined pharmacotherapy and psychological therapies for post traumatic stress disorder (PTSD) Cochrane Database Syst Rev 2010;7:CD007316. DOI:10.1002/14651858.CD007316.pub2.

Ho MSK, Lee CW. Cognitive behaviour therapy versus eye movement desensitization and reprocessing for post-traumatic disorder – is it all in the homework then? Eur Rev Appl Psychol 2012;62:253–260.

Hobbs JDJ, Kushner MG, Lee SS, et al. Meta-analysis of Supplemental Treatment for Depressive and Anxiety Disorders in Patients Being Treated for Alcohol Dependence. Am J Addict 2011;20:319–329.

Hofmann SG, Sawyer AT, Witt AA, et al. The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. J Consult Clin Psychol 2010;78(2):169-183.

Huntley AL, Araya R, Salisbury C. Group psychological therapies for depression in the community: systematic review and meta-analysis. Br J Psychiatry 2012;200:184–190. doi: 10.1192/bjp.bp.111.092049

Imel ZE, Laska, K, Jakupcak M, et al. Meta-Analysis of Dropout in Treatments for Posttraumatic Stress Disorder. J Consult Clin Psychol 2013;81(3)394-404.

IsHak WW, Ha K, Kapitanski N, et al. The Impact of Psychotherapy, Pharmacotherapy, and Their Combination on Quality of Life in Depression. Harv Rev Psychiatry 2011;19:277–289.

Jakobsen JC, Hansen JL, Simonsen E, et al. The effect of adding psychodynamic therapy to antidepressants in patients with major depressive disorder. A systematic review of randomized clinical trials with meta-analyses and trial sequential analyses J Affect Disord 2012;137:4–14.

Jakobsen JC, Hansen JL, Simonsen S, et al. Effects of cognitive therapy versus interpersonal psychotherapy in patients with major depressive disorder: a systematic review of randomized clinical trials with meta-analyses and trial sequential analyses. Psychol Med 2012;42:1343–1357. doi:10.1017/S0033291711002236.

Krishna M, Honagodu A, Rajendra R, et al. A systematic review and meta-analysis of group psychotherapy for sub-clinical depression in older adults. Int J of Geriatr Psychiatry 2013;28(9):881-888.

Krishna M, Jauhari A, Lepping P, et al. Is group psychotherapy effective in older adults with depression? A systematic review. Int J of Geriatr Psychiatry. 2011;26(4):331-340.

Leisenring F, Rabung S. Long-term psychodynamic psychotherapy in complex mental disorders: update of a meta-analysis. Br J Psychiatry 2011;199(1):15-22.

Luciano M, Del Vecchio V, Giacco D, et al. A 'family affair'? The impact of family psychoeducational interventions on depression Expert Rev. Neurother 2012;12(1):83–92.

Markowitz SM, Gonzalez JS, Wilkinson JL, et al. A Review of Treating Depression in Diabetes: Emerging Findings. Psychosomatics 2011;52:1–18.

Mavrides N, Nemeroff C. Treatment of depression in cardiovascular disease. Depress Anxiety 2013;30(4):328-41.

Nenova M, Morris L, Paul L, et al. Psychosocial Interventions With Cognitive-Behavioral Components for the Treatment of Cancer-Related Traumatic Stress Symptoms: A Review of Randomized Controlled Trials. J Cogn Psychother 2013;27(3)258-284.

Nickerson A, Bryant RA, Silove D, et al. A critical review of psychological treatments of posttraumatic stress disorder in refugees. Clin Psychol Rev 2011;31:399–417.

Oestergaard S, Møldrup C. Optimal duration of combined psychotherapy and pharmacotherapy for patients with moderate and severe depression: A meta-analysis. J Affect Disord 2011;131:24–36.

Olatunji BO, Davis ML, Powers MB, et al. Cognitive-behavioral therapy for obsessive-compulsive disorder: A meta-analysis of treatment outcome and moderators. J Psychiatr Res 2013;47(1):33-41.

Opris D, Pintea S, Garcia-Palacios A, et al. Virtual reality exposure therapy in anxiety disorders: A quantitative meta-analysis. Depress Anxiety 2012;29(2):85-93.

Palic S, Elklit A. Psychosocial treatment of post-traumatic stress disorder in adult refugees: a systematic review of prospective treatment outcome studies and a critique. J Affect Disord 2011;131(1-3):8-23.

Piet J, Hougaard E. The effect of mindfulness-based cognitive therapy for prevention of relapse in recurrent major depressive disorder: a systematic review and meta-analysis. Clin Psychol Rev 2011;31(6):1032-1040.

Possemato K, The current state of intervention research for posttraumatic stress disorder within the primary care setting. J Clin Psychol Med Settings 2011;18(3):268-280.

Powers MB, Halpern JM, Ferenschak MP, et al. A meta-analytic review of prolonged exposure for posttraumatic stress disorder. Clin Psychol Rev 2010;30(6):635-641.

Rakofsky JJ, Dunlop BW, Treating Nonspecific Anxiety and Anxiety Disorders in Patients With Bipolar Disorder: A Review. J Clin Psychiatry 2011;72(1):81-91.

Richards D, Richardson T. Computer-based psychological treatments for depression: A systematic review and meta-analysis Clin Psychol Rev 2012;32:329–342.

Rizzo M, Creed F, Goldberg D, et al. A systematic review of non-pharmacological treatments for depression in people with chronic physical health problems. J Psychosom Res 2011;71(1):18-27.

Roberts NP, Kitchiner NJ, Kenardy J, et al. Early psychological interventions to treat acute traumatic stress symptoms. Cochrane Database Syst Rev 2010;3:CD007944. doi:10.1002/14651858.CD007944.pub2.

Rosenberg Edwards A. Psychotherapy and Pharmacotherapy for Social Anxiety Disorder: A Comprehensive Meta-Analysis. Dissertation abstracts international: Section B: the Sciences and Engineering 2011;72(4-B):2433-2601.

Roshanaei-Moghaddam B, Pauly MC, Atkins DC, et al. Relative effects of CBT and pharmacotherapy in depression versus anxiety: Is medication somewhat better for depression, and CBT somewhat better for anxiety? Depress Anxiety 2011;28:560–567.

Samad Z, Brealey S, Gilbody S. The effectiveness of behavioural therapy for the treatment of depression in older adults: a meta-analysis. Int J of Geriatr Psychiatry 2011;26(12):1211-1220.

Sanchez-Meca J, Rosa-Alcázar AI, Marín-Martínez F, et al. Psychological treatment of panic disorder with or without agoraphobia: a meta-analyis. Clin Psychol Rev 2010;30(1):37-50.

Schoenfeld FB, DeViva JC, Manber R. Treatment of sleep disturbances in posttraumatic stress disorder: A review. J Rehabil Res Dev 2012;49(5):729–752.

Sempértegui GA, Karreman A, Arntz A, et al. Schema therapy for borderline personality disorder: a comprehensive review of its empirical foundations, effectiveness and implementation possibilities. Clin Psychol Rev 2013;33(3):426-47.

Sloan DM, Bovin MJ, Schnurr PP. Review of group treatment for PTSD. J Rehabil Res Dev 2012;49(5):689-701.

Sloan DM, Feinstein BA, Gallagher MW, et al. Efficiacy of Group Treatment for Posttraumatic Stress Disorder Symptoms: A Meta-Analysis. Psychol Trauma 2013;5(2):176-183.

Sloan DM, Gallagher MW, Feinstein BA, et al. Efficacy of telehealth treatments for posttraumatic stress-related symptoms: a meta-analysis. Cogn Behav Ther 2011;40(2):111-125.

Spielmans GI, Berman MI, Usitalo AN. Psychotherapy Versus Second-Generation Antidepressants in the Treatment of Depression A Meta-Analysis. J Nerv Ment Dis 2011;199:142–149.

Spijker J, van Straten A, Bockting CL, et al. Psychotherapy, Antidepressants, and Their Combination for Chronic Major Depressive Disorder: A Systematic Review. Can J Psychiatry 2013:58(7):386-392.

Stagg EK, Lazenby M. Best Practices for the Nonpharmacological Treatment of Depression at the End of Life. Am J Hosp Palliat Care 2012;29(3):183-194.

Steenkamp MM, Litz BT Psychotherapy for military-related posttraumatic stress disorder: review of the evidence. Clin Psychol Rev 2013;33(1):45-53.

Stoffers JM, Völlm BA, Rücker G, et al. Psychological therapies for people with borderline personality disorder (Review), Cochrane Database Syst Rev 2012;8:CD005652. doi:10.1002/14651858.CD005652.pub2.

Van Dam D, Vedel E, Ehring T, et al. Psychological treatments for concurrent posttraumatic stress disorder and substance use disorder: A systematic review. Clin Psychol Rev 2012;32:202–214.

Van der Feltz-Cornelis CM, Nuyen J, Stoop C, et al. Effect of interventions for major depressive disorder and significant depressive symptoms in patients with diabetes mellitus: a systematic review and meta-analysis Gen Hosp Psychiatry 2010;32:380–395.

Van der Heiden C. Metacognitions in generalized anxiety disorder: theoretical and practical perspectives. Expert Rev Neurother 2013;13(2):135-141.

Van Emmerik AA, Reijntjes A, Kamphuis JH. Writing Therapy for Posttraumatic Stress: A Meta-Analysis. Psychother Psychosom 2013;82:82-88.

Van Hees ML, Rotter T, Ellermann T, et al. The effectiveness of individual interpersonal psychotherapy as a treatment for major depressive disorder in adult outpatients: A systematic review. BMC Psychiatry 2013;13:22. doi:10.1186/1471-244X-13-22.

Van Straten A, Geraedts A, Verdonck-de Leeuw IM, et al. Psychological treatment of depressive symptoms in patients with medical disorders: a meta-analysis. J Psychosom Res 2010;69(1):23-32.

Vøllestad J, Nielsen MB, Nielsen GH Mindfulness- and acceptance-based interventions for anxiety disorders: A systematic review and meta-analysis. Br J Clin Psychol 2012;51:239–260.

Watts BV, Schnurr PP, Mayo L, et al. Meta-Analysis of the Efficacy of Treatments for Posttraumatic Stress Disorder. J Clin Psychiatry 2013;74(6):541-550.

Supplement Table 4: Journals in which the 95 reviews were published

Journal	2010	2011	2012	2013	Total number
Clin Psychol Rev	4	3	5	8	20
Depress Anxiety	-	1	3	1	5
J Affect Disord	-	2	1	2	5
Cochrane Database Syst Rev	3	-	1	-	4
Br J Psychiatry	1	1	1	-	3
Can J Psychiatry	-	1	-	2	3
Int J of Geriatr Psychiatry	-	2	-	1	3
J Clin Psychiatry	-	1	1	1	3
Expert Rev Neurother	-	-	1	1	2
Harv Rev Psychiatry	-	1	1	-	2
J Consult Clin Psychol	1	-	-	1	2
J Psychosom Res	1	1	-	-	2
Psychol Med	-	1	1	-	2
Acta Psychiatr Scand	1	-	-	-	1
Am J Addict	-	1	-	-	1
Am J Hosp Palliat Care	-	-	1	-	1
Am J Psychiatry	-	1	-	-	1
BMC Psychiatry	-	-	-	1	1
Brain inj	-	-	-	1	1
Br J Clin Psychol	-	-	1	-	1
Can J Occup Ther	-	-	-	1	1
Clin Gerontol	-	-	-	1	1
Cogn Behav Ther	-	1	-	-	1
Dissertations Abstracts international: Section B: The Sciences and Engineering	-	1	-	-	1
Eur Rev Appl Psychol	-	-	1	-	1
Gen Hosp Psychiatry	1	-	-	-	1
J Am Geriatr Soc	-	-	1	-	1
J Anxiety Disord	-	-	1	-	1

J Clin Oncol	-	-	-	1	1
J Clin Psychol Med Settings	-	1	-	-	1
J Cogn Psychother	-	-	-	1	1
J Natl Cancer Inst	-	-	1	-	1
J Nerv Ment Dis	-	1	-	-	1
J Psychiatr Res	-	-	-	1	1
J Rehabil Res Dev	-	-	1	-	1
J Res Nurs	-	-	-	1	1
Neuropharmacology	-	-	1	-	1
Nord J Psychiatry	-	1	-	-	1
Perm J	-	-	-	1	1
Prog Neuropsychopharmacol Biol Psychiatry	-	-	-	1	1
Psychiatr Clin North Am	-	-	1	-	1
Psychiatry	-	1	-	-	1
Psychol Rep	-	1	-	-	1
Psychol Trauma	-	-	-	1	1
Psychosom Med	-	-	-	1	1
Psychosomatics	-	1	-	-	1
Psychother Psychosom	-	-	-	1	1
Respir Med	-	1	-	-	1
Scientific World Journal	-	-	1	-	1
Worldviews Evid Based Nurs	-	-	1	-	1

Supplement Table 5: Mandatory disclosure of Conflicts of Interest by Journal at the time of publication of the respective review.

Journal	Personal COI	Financial COI	Non-Financial COI
Acta Psychiatr Scand	no	Yes	No
Am J Addict	no	Yes	Yes
Am J Hosp Palliat Care	no	yes	No
Am J Psychiatry	no	yes	No
BMC Psychiatry	no	no	No
Brain Inj	yes	yes	No
Br J Clin Psychol	no	no	No
Br J Psychiatry	yes	yes	Yes
Can J Occup Ther	no	no	No
Can J Psychiatry	yes	yes	Yes
Clin Gerontol	no	no	No
Clin Psychol Rev	yes	yes	Yes
Cochrane Database Syst Rev	yes	yes	Yes
Cogn Behav Ther	no	no	No
Depress Anxiety	yes	yes	No
Dissertations Abstracts international: Section B: The Sciences and Engineering	no	no	No
Eur Rev Appl Psychol	yes	yes	Yes
Expert Rev Neurother	yes	yes	Yes
Gen Hosp Psychiatry	yes	yes	Yes
Harv Rev Psychiatry	yes	yes	No
Int J of Geriatr Psychiatry	yes	yes	No
J Affect Disord	yes	yes	Yes
J Am Geriatr Soc	yes	yes	Yes
J Anxiety Disord	yes	yes	Yes
J Clin Oncol	yes	yes	No
J Clin Psychiatry	yes	yes	No

J Clin Psychol Med Settings	no	yes	No
J Cogn Psychother	unclear	unclear	Unclear
J Consult Clin Psychol	yes	yes	No
J Natl Cancer Inst	no	yes	No
J Nerv Ment Dis	yes	yes	Yes
J Psychiatr Res	yes	yes	No
J Psychosom Res	yes	yes	Yes
J Rehabil Res Dev	yes	yes	No
J Res Nurs	no	yes	No
Neuropharmacology	yes	yes	Yes
Nord J Psychiatry	no	yes	No
Perm J	yes	yes	No
Prog Neuropsychopharmacol Biol Psychiatry	yes	yes	Yes
Psychiatr Clin North Am	no	yes	No
Psychiatry	no	no	No
Psychol Med	yes	yes	No
Psychol Rep	no	no	No
Psychol Trauma	yes	yes	Yes
Psychosom Med	yes	yes	No
Psychosomatics	no	yes	No
Psychother Psychosom	no	yes	No
Respir Med	yes	yes	Yes
Scientific World Journal	no	no	No
Worldviews Evid Based Nurs	no	yes	No

Supplement Table 6: References of the own primary studies included into 34 reviews by the review authors

Abbass AA, Campbell S, Magee K, et al. Intensive shortterm dynamic psychotherapy to reduce rates of emergency department return visits for patients with medically unexplained symptoms: preliminary evidence from a pre-post intervention study. CJEM 2009;11(6):529–534.

Abbass A. Intensive short-term dynamic psychotherapy in a private psychiatric office: Clinical and cost effectiveness. Am J Psychother 2002;56:225-232.

Abbass A. Intensive short-term dynamic psychotherapy of treatment-resistant depression: a pilot study. Depress Anxiety 2006;23:449–452.

Abbass A. Modified short-term dynamic psychotherapy in patients with bipolar disorder. Preliminary report of a case series. Can Child Psychiatry Rev 2002;11(1):19–22.

Abbass A. Office based research in intensive short-term dynamic psychotherapy (ISTDP): data from the first 6 years of practice. Ad Hoc Bull Short Term Dyn Psychother 2002;6(2):5–14.

Abbass A, Sheldon A, Gyra A, et al. Intensive short-term dynamic psychotherapy for DSM-IV personality disorders. J Nerv Ment Dis 2008;196:211–216.

Abbass A. Small-group videotape training for psychotherapy skill development. Acad Psychiatry 2004;28:151–155.

Andersson G, Waara J, Jonsson U, et al. Internet-based self-help versus one-session exposure in the treatment of spider phobia: a randomized controlled trial. Cogn Behav Ther 2009;38:114-120.

Araya R, Rojas G, Fritsch R, et al. Treating depression in primary care in low-income women in Santiago, Chile: a randomised controlled trial. Lancet 2003;361:995–1000.

Arntz A, Dietzel R, Dreessen L. Assumptions in borderline personality disorder, specificity, stability and relationship with etiological factors. Behav Res Ther 1999;37(6):545–557.

Arntz A, Dreessen L, Schouten E, et al. Beliefs in personality disorders: A test with the Personality Disorder Belief Questionnaire. Behav Res Ther 2004;42(10):1215–1225.

Arntz A, Klokman J, Sieswerda S. An experimental test of the schema mode model of borderline personality disorder. J Behav Ther Exp Psychiatry 2005;36(3):226–239.

Arntz A, Weertman A, Salet S. Interpretation bias in Cluster-C and borderline personality disorders. Behav Res Ther 2011;49(8):472–481.

Beck JG, Coffey SF, Foy DW, et al. Group cognitive behavior therapy for chronic posttraumatic stress disorder: An initial randomized pilot study. Behav Ther 2009;40:82–92.

Bisson JI, Shepherd JP, Joy D, et al. Early cognitive-behavioural therapy for post-traumatic stress symptoms after physical injury. Br J Psychiatry 2004;184:63-69.

Bormann JE, Thorp SR, Wetherell JL, et al. Meditation-Based Mantram Intervention for Veterans With Posttraumatic Stress Disorder: A Randomized Trial. Psychol Trauma 2012, March. Advance online publication. doi: 10.1037/a0027522.

Botella C, Garcia-Palacios A, Villa H, et al. Virtual reality exposure in the treatment of panic disorder and agoraphobia: a controlled study. Clin Psychol Psychother 2007;14:164–175.

Chard KM. An evaluation of cognitive processing therapy for the treatment of posttraumatic stress disorder related to childhood sexual abuse. J Consult Clin Psychol 2005;73(5):965–971.

Chard KM, Schumm JA, McIlvain SM, et al. Exploring the efficacy of a residential treatment for veterans with PTSD and traumatic brain injury. J Trauma Stress 2011;24(3):347–351.

Chard KM, Schumm JA, Owens GP, et al. A comparison of OEF and OIF veterans and Vietnam veterans receiving cognitive processing therapy. J Trauma Stress 2010;23(1):25–32.

De Jonghe F, Hendriksen M, van Aalst G, et al. Psychotherapy alone and combined with pharmacotherapy in the treatment of depression. Br J Psychiatry 2004;185:37-45.

Dickhaut V, Arntz A. Combined group and individual schema therapy for borderline personality disorder: A pilot study. J Behav Ther Exp Psychiatr 2014;45:242-251.

Dimidjian S, Hollon SD, Dobson KS, et al. Randomized trial of behavioral activation, cognitive therapy, and antidepressant medication in the acute treatment of adults with major depression. J Consult Clin Psychol 2006;74:658–670.

DuHamel KN, Mosher CE, Winkel G, et al. Randomized clinical trial of Telefone – administered cognitive-behavioral therapy to reduce posttraumatic stress disorder and distress symptoms after hematopoietic stem-cell transplantation. J Clin Oncol 2010;28(23):3754-3761.

Ekers D, Richards D, Gilbody S. A meta-analysis of behavioural therapy for depression. Psychol Med 2008;38(5):611-623.

Fava GA, Rafanelli C, Grandi S, et al. Six-year outcome for cognitive behavioral treatment of residual symptoms in major depression. Am J Psychiatry 1998;155:1443–1445.

Fava GA, Ruini C, Rafanelli C, et al. Six-year outcome of cognitive behavior therapy for prevention of recurrent depression. Am J Psychiatry 2004;161:1872–1876.

Fiorillo A, Malangone C, Del Vecchio VC, et al. Maj The effect of family psychoeducational interventions on patients with depression. Eur Psychiatry 2011;26:7.

Foa EB, Dancu CV, Hembree EA, et al. A Comparison of exposure therapy, stress inoculation training, and their combination for reducing posttraumatic stress disorder in female assault victims. J Consult Clin Psychol 1999;67(2):194-200.

Foa EB, Hembree EA, Cahill SP, et al. Randomized trial of prolonged exposure for posttraumatic stress disorder with and without cognitive restructuring: outcome at academic and community clinics. J Consult Clin Psychol 2005;73(5):953-964.

Foa EB, Rothbaum BO, Riggs DS, et al. Treatment of posttraumatic stress disorder in rape victims : A comparison between cognitive-behavioral procedures and counseling. J Consult Clin Psychol 1991;59(5):715-723.

Friedman MJ, Marmar CR, Baker DG, et al. Randornized, double-blind comparison of sertraline and placebo for posttraumatic stress disorder in a Departrnent ofVeterans Affairs setting. J Clin Psychiatry 2007;68(5):711- 720.

Furmark T, Carlbring P, Hedman E, et al. Guided and unguided self-help for social anxiety disorder: randomized controlled trial. Br J Psychiatry 2009;195(5):440-447.

Garcia-Palacios A, Hoffman H, Carlin A, et al. Virtual reality in the treatment of spider phobia: a controlled study. Behav Res Ther 2002;40:983–993.

Giesen-Bloo J, van Dyck R, Spinhoven P, et al. Outpatient psychotherapy for borderline personality disorder randomized trial of schema-focused therapy vs. transference-focused psychotherapy. Arch Gen Psychiatry 2006;63(6):649–658.

Gilboa-Schechtman E, Foa EB, Shafran N, et al. Prolonged exposure vs dynamic therapy for adolescent PTSD: A pilot randomized controlled trial. J Am Acad Child Adolesc Psychiatry 2010;49(10):1034-1042.

Gray MJ, Schorr Y, Nash W, et al. Adaptive disclosure: An open trial of a novel exposure-based intervention for service members with combat-related psychological stress injuries. Behav Ther 2012;43:407–415.

Hellstrom K, Öst LG. One-session therapist directed exposure vs. 2 forms of manual directed self-exposure in the treatment of spider phobia. Behav Res Ther 1995;33:959–965.

Huband N, McMurran M, Evans C, et al. Social problem-solving plus psychoeducation for adults with personality disorder : pragmatic randomised controlled trial. Br J Psychiatry 2007;190:307-313.

Joling KJ, van Hout HP, van't Veer-Tazelaar PJ, et al. How effective is bibliotherapy for very old adults with subthreshold depression? A randomized controlled trial. Am J Geriatr Psychiatry 2011;19(3):256-265.

Katon WJ, Von Korff M, Lin EH, et al. The Pathways Study: a randomized trial of collaborative care in patients with diabetes and depression. Arch Gen Psychiatry 2004;61:1042–1049.

Lee CW, Gavriel H, Drummond PD, et al. Treatment of PTSD: stress inoculation training with prolonged exposure compared to EMDR. J Clin Psychol 2002;58(9):1071–1089.

Li M, Chen K, Mo Z. Use of qigong therapy in the detoxification of heroin addicts. Altern Ther Health Med 2002;8:50–59.

Lobbestael J, Arntz A, Cima M, et al. Effects of induced anger in patients with antisocial personality disorder. Psychol Med 2009;39(4):557–568.

Lobbestael J, Arntz A. Emotional, cognitive and physiological correlates of abuse-related stress in borderline and antisocial personality disorder. Behav Res Ther 2010;48(2):116–124.

Lobbestael J, Arntz A, Sieswerda S. Schema modes and childhood abuse in borderline and antisocial patients. J Behav Ther Exp Psychiatry 2005;36(3):240–253.

Lobbestael J, Arntz A. The state dependency of cognitive schemas in antisocial patients. Psychiatry Res 2012;198:452-456.

Markowitz JC, Kocsis JH, Bleiberg KL, et al. A comparative trial of psychotherapy and pharmacotherapy for "pure" dysthymic patients. J Affect Dis 2005;89:167–175.

Markowitz JC, Kocsis JH, Christos P, et al. Pilot study of interpersonal psychotherapy for dysthymic patients with secondary alcohol abuse or dependence. J Nerv Ment Dis 2008;196:468–474.

Markowitz JC, Kocsis JH, Fishman B, et al. Treatment of depressive symptoms in human immunodeficiency virus-positive patients. Arch Gen Psychiatry 1998;55:452–457.

McDonagh A, Friedman M, McHugo G, et al. Randomized trial of cognitivebehavioral
therapy for chronic posttraumatic stress disorder in adult female survivors of childhood sexual abuse. J Consult Clin Psycho 2005;73(3):515-524.

Monson CM, Schnurr PP, Resick PA, et al. Cognitive processing therapy for veterans with military-related posttraumatic stress disorder. J Consult Clin Psychol 2006;74(5):898–907.

Nacasch N, Foa EB, Huppert JD, et al. The efficacy of prolonged exposure therapy for combat and terror-related PTSD: A randomized control comparison with treatment as usual. Am J Psychiatry 2011;72(9):1174-1180.

Nadort M, Arntz A, Smit JH, et al. Implementation of outpatient schema therapy for borderline personality disorder with versus without crisis support of the therapist outside office hours: A randomized trial. Behav Res Ther 2009;47:961–973.

Nadort M, van Dyck R, Smit JA, et al. Three preparatory studies for promoting implementation of outpatient schema therapy for borderline personality disorder in general mental health care. Behav Res Ther 2009;47(11):938–945.

Neylan TC, Lenoci M, Maglione ML, et al. The effect of nefazodone on subjective and objective sleep quality in posttraumatic stress disorder. J Clin Psychiatry 2003;64(4):445–450.

Neylan TC, Lenoci M, Samuelson KW, et al. No improvement of post-traumatic stress disorder symptoms with guanfacine treat-ment. Am J Psychiatry 2006;163(12):2186–2188.

Nordin S, Carlbring P, Cuijpers P, et al. Expanding the limits of bibliotherapy for panic disorder: Randomized trial of self-help without support but with a clear deadline. Behav Ther 2010;41(3):267-276.

Öst LG, Salkovskis PM, Hellstrom K. One-session therapist-directed exposure vs. Self-exposure in the treatment of spider phobia. Behav Ther 1991;22:407-422.

Palic S, Elkit A. An explorative outcome study of CBT-based multidisciplinary treatment in a diverse group of refugees from a Danish treatment centre for rehabilitation of traumatized refugees. Torture 2009;19(3):248-270.

Perlis RH, Nierenberg AA, Alpert JE, et al. Effects of adding cognitive therapy to fluoxetine dose increase on risk of relapse and residual symptoms in continuation treatment of major depressive disorder. J Clin Psychopharmacol 2002;22:474–480.

Reiss N, Lieb K, Arntz A, et al. Responding to the treatment challenge of patients with severe BPD: results of three pilot studies of inpatient schema therapy. Behav Cog Psychother 2014;42:355-367.

Resick PA, Galovski TE, O'Brien Uhlmansiek M, et al. A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interper-sonal violence. J Consult Clin Psychol 2008;76(2):243–258.

Resick PA, Nishith P, Weaver TL, et al. A comparison of cognitive-processing therapy with pro-longed exposure and a waiting condition for the treatment of chronic posttraumatic stress disorder in female rape vic-tims. J Consult Clin Psychol 2002;70(4):867–879.

Schindler A, Hiller W. Therapieeffekte und Responseraten bei unipolar deperssiven Patienten einer verhaltenstherapeutischen Hochschulambulanz [Therapy effects and response rates of cognitive-bahavioral treatment for unipolar depressive patients in an outpatient clinic] Zeitschrift für Klinische Psychologie und Psychotherapie: Forschung und Praxis 2010;39:107-115.

Schnurr PP, Friedman MJ, Engel CC, et al. Cognitive behavioral therapy for posttraumatic stress disorder in women: a randomized controlled trial. JAMA 2007;297(8):820-830.

Schnurr PP, Friedman MJ, Foy DW, et al. Randomized trial of traumafocused group therapy for posttraumatic stress disorder: results li•om a department of veterans affairs eooperative study. Arch Gen Psychiatry 2003;60(5):481-489.

Schnurr PP, Friedman MJ, Lavori PW, et al. Design of Department of Veterans Affairs Cooperative Study No. 420: Group treatment of posttraumatic stress disorder. Control Clin Trials 2001;22(1):74–88.

Shelton RC, Haman KL, Rapaport MH, et al. A randomized, double-blind, active-control study of sertraline versus venlafaxine XR in major depressive disorder. J Clin Psychiatry 2006;67:1674–1681.

Sieswerda S, Arntz A, Kindt M. Successful psychotherapy reduces hypervigilance in borderline personality disorder. Behav Cog Psychotherapy 2007;35(4):387–402.

Sieswerda S, Arntz A, Mertens I, et al. Hypervigilance in patients with borderline personality disorder: Specificity, automaticity, and predictors. Behav Res Ther 2007;45(5):1011–1024.

Spinhoven P, Giesen-Bloo J, van Dyck R, et al. Can assessors and therapists predict the outcome of long-term psychotherapy in borderline personality disorder? J Clin Psychol 2008;64(6):667–686.

Spinhoven P, Giesen-Bloo J, van Dyck R, et al. The therapeutic alliance in schema-focused therapy and transference-focused psychotherapy for borderline personality disorder. J Consult Clin Psychol 2007;75(1):104–115.

Swanson LM, Favorite TK, Horin E, et al. A combined group treatment for nightmares and insomnia in combat veterans: A pilot study. J Trauma Stress 2009;22(6):639–642.

Taylor DT, Meader N, Bird V, et al. Pharmacology subgroup of the National Institute for Health and Clinical Excellence Guideline Development Group for Depression in Chronic Physical Health Problems. Pharmacological interventions for people with depression and chronic physical health problems: Systematic review and meta-analyses of safety and efficacy. Br J Psychiatry 2011;198:179–188.

Van Asselt ADI, Dirksen CD, Arntz A, et al. Outpatient psychotherapy for borderline personality disorder: Cost effectiveness of schema-focused therapy versus transference focused psychotherapy. Br J Psychiatry 2008;192:450–457.

Van der Heiden C, Muris P, van der Molen HT. Randomized comrolled rrial on the cffectiveness of meracognirive therapy and inrolerance-of-uncerrainry rherapy for generalized anxiery disorder. Bebav Res Ther 2012;50(2):100-109.

Van Emmerik AAP, Kamphuis JH, Ernmelkamp PMG. Treating acute stress disorder and posttraumatic stress disorder with cognitive behavioral therapy or structured writing therapy: a randomized controlled trial. Psychother Psychosom 2008;77:93-100.

Vilhauer JS, Young S, Kealoha C, et al. Treating major depression by creating positive expectations for the future: a pilot study for the effectiveness of future directed therapy (FDT) on symptom severity and quality of life. CNS Neurosci Ther 2012;18(2):102-109.

Watts BV, Landon B, Groft A, et al. A sharn controlled study of repetitive transcranial magnetic stimulation for posttraumatic stress disorder. Brain Stimul 2012;5(1):38-43.

Willemse GRWM, Smit F, Cuijpers P, et al. Minimal-contact psychotherapy for sub-threshold depression in primary care. Br J Psychiatry 2004;185: 416-421.

Williams Jr JW, Katon W, Lin EH, et al. The effectiveness of depression care management on diabetesrelated outcomes in older patients. Ann Intern Med 2004;140:1015–1024.

Lieb et al., BMJ Open submission Checklist of items to include when reporting a systematic review or meta-analysis

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	n.a.
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	5
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Suppl Tables 1 and 2

Section/topic	#	Checklist item	Reported on page #
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	5 and Fig. 1
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	n.a.
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	7
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	n.a.
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	n.a.
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	n.a.
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	n.a.
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Fig. 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	n.a.
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome-level assessment (see Item 12).	n.a.
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group and (b) effect estimates and	n.a.

Section/topic	#	Checklist item	Reported on page #
		confidence intervals, ideally with a forest plot.	
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	n.a.
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	9
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression) (see Item 16).	n.a.
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., health care providers, users, and policy makers).	10f.
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review level (e.g., incomplete retrieval of identified research, reporting bias).	12
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	13
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	13

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Conflicts of interest and spin in reviews of psychological therapies: A systematic review

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Conflicts of interest and spin in reviews of psychological therapies: A systematic review

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Abstract

Objective To explore conflicts of interest (COI) and their reporting in systematic reviews of psychological therapies and to evaluate spin in the conclusions of the reviews.

Methods MEDLINE and PsycINFO databases were searched for systematic reviews published between 2010 and 2013 that assessed effects of psychological therapies for anxiety, depressive or personality disorders and included at least one randomized controlled trial (RCT). Required COI disclosure by journal, disclosed COI by review authors and the inclusion of own primary studies by review authors were extracted. Researcher allegiance, i.e. that researchers concluded favourably about the interventions they have studied, as well as spin, i.e. differences between results and conclusions of the reviews, were rated by two independent raters.

Results 936 references were retrieved, 95 reviews fulfilled eligibility criteria. 59 compared psychological therapies with other forms of psychological therapies, and 36 psychological therapies with pharmacological interventions. Financial, non-financial, and personal COI were disclosed in 22, 4, and 1 review, respectively. Two of 86 own primary studies of review authors included in 34 reviews were disclosed by review authors. In 15 of the reviews, authors showed an allegiance effect to the evaluated psychological therapy that was never disclosed. Spin in review conclusions was found in 27 of 95 reviews. Reviews with a conclusion in favour of psychological therapies (vs. pharmacological interventions) were at high risk for a spin in conclusions (OR = 8.31 [1.41 to 49.05]). Spin was related in trend to the inclusion of own primary studies in the systematic review (OR = 2.08 [CI 0.83 to 5.18] p = .11) and researcher allegiance (OR = 2.63 [0.84 to 8.16] p= 0.16).

Conclusions Non-financial COI, especially the inclusion of own primary studies into reviews and researcher allegiance, are frequently seen in systematic reviews of psychological therapies and need more transparency and better management.

Article summary

Strengths and limitations of this study

- This study addresses a widely neglected research topic, i.e. spin introduced by non-financial conflicts of interest, e.g. the researcher allegiance to a specific therapy, in reviews on psychotherapy studies.
- Although authors of reviews of psychological therapies frequently show COI (which mainly are not declared), the relationship to spin in review conclusions is less clear and has to be interpreted with caution.
- The selection of studies up to 2013 does not reflect possible changes in COI declarations in recent years. However, the authors are not aware of changes in COI declaration requirements regarding non-financial COI in 2014 or 2015.

Introduction

Conflicts of interest (COI) are defined as a set of circumstances that creates a risk that a professional judgement or action regarding a primary interest will be unduly influenced by a secondary interest[1 2]. Research on COI has so far mainly focused on financial COI such as close financial relationships between researchers or medical doctors and pharmaceutical companies or the financing of drug trials by pharmaceutical companies[3-7]. Such research has shown that studies funded by pharmaceutical companies more often yield results or conclusions in favour of the sponsoring company as compared to non-industry-funded trials [8 9], that close relationships of researchers to pharmaceutical companies are linked to biased assessments of drug safety and efficacy[10 11], that positive trials are more likely to be published than trials unfavourable to sponsors[12], and that COI are underreported in meta-analyses of pharmacological treatments[13 14].

The influence of non-financial COI, however, on the framing of research questions, the data analysis and interpretation of results, or the decision which results are being published, has been much less extensively studied[15]. With respect to outcome research of psychological therapies, researcher allegiance constitutes an important non-financial COI. Allegiance covers the belief of a researcher in the superiority of a treatment[16 17]. Allegiance may be due to a special training in one specific psychological therapy, the involvement in previous efficacy research about this psychological therapy or the involvement in development of etiological models via basic research.[18-20] Empirical studies showed a strong impact of researcher allegiance on outcome in psychotherapy studies: A recent meta-meta-analysis showed a robust and moderate allegiance outcome association (r = .26)[21], and such an association is also present in equally effective treatments[22]. Taking allegiance into account for the explanation of effect differences between two active treatments studies with balanced allegiance for two different treatments show no difference in the effectiveness[23].

Since nothing is known about the extent and nature of non-financial COI in systematic reviews of psychological therapies, the aim of this study was to investigate how often non-financial COI are present and disclosed in systematic reviews of psychological therapies and to analyze whether these COI increase the risk of spin in the conclusions of the reviews.

Methods

Search strategy and eligibility criteria of systematic reviews

We searched the MEDLINE and PsycINFO databases for systematic reviews or meta-analyses of randomised controlled trials (RCT) on psychological therapies. Reviews were selected if they fulfilled the following inclusion criteria: 1) Inclusion of psychological therapies to treat patients with anxiety disorders, personality disorders and/or major depressive disorders in adults, 2) Active control groups with either other forms of psychological therapy or pharmacological interventions, 3) Inclusion of at least one randomised study, 4) English language. Searches were last run on February 3rd 2014, covering the publication period of January 2010 to December 2013. For exact MEDLINE and PsycINFO search strategies, confer supplement tables 1 and 2.

Screening and inclusion of systematic reviews and primary studies

Retrieved references were initially screened for inclusion by title and abstract by two independent researchers. In a second step, full texts of relevant reviews were retrieved and assessed for inclusion by two independent researchers. These reviews were used to rate conflicts of interest and their disclosure (see below).

Primary studies included in these reviews were identified from the reference list of the systematic reviews and retrieved if one of the co-authors of the review was an author of the respective primary study. These primary studies were then used to rate researcher allegiance (see below).

Assessment of disclosed and undisclosed COI

All disclosed COI were extracted: financial COI (honoraria e.g. for consulting, lectures, scientific articles, training courses or money for research projects), non-financial COI (e.g. researcher allegiance to a psychological therapy, special qualification in a psychological therapy,

enthusiasm for a psychological therapy in scientific publications, lectures and research, or inclusion of own primary studies in reviews), and personal COI (e.g. employee or private relationship to an employee of a company - regularly addressed as relationships to pharmaceutical companies). If no COI was reported, the websites of the respective journals as well as the guidelines for authors were screened for requirements of COI disclosures at the time of the publication of the review. In addition, we assessed whether review authors included own studies on psychological therapies into their review and whether this inclusion was disclosed.

Rating of researcher allegiance

In case that a review author included at least one own primary study (which he or she co-authored) into the review, we retrieved these primary studies and rated the researcher allegiance according to information presented in the primary study (note that a rating of researcher allegiance was not possible in the reviews since these do not provide essential information to rate researcher allegiance according to established standards.[18-20]). Researcher allegiance was rated in 73 of the 86 included primary studies since 13 reviews did not compare psychological therapies to other treatments and were therefore excluded.

Researcher allegiance was defined to be present, if the author a) recommended the respective psychological therapy over another therapy and was b) either involved in the development of the respective psychological therapy or c) was involved in research of/development of the etiological model of the psychological therapy. Two independent researchers (JOS, JB) assessed allegiance in the primary studies and disagreements were resolved with a third rater (KL). If researcher allegiance was rated to be present in at least one of the primary studies included in a review, this review was rated as afflicted by researcher allegiance. Kappa statistics showed substantial inter-rater reliability (k = 0.62; agreement 82%).

Assessment of spin in review conclusions

To assess spin in review conclusions, we evaluated whether the conclusion of the review as expressed in the abstract or the discussion section was inconsistent or consistent to the

empirical results described in the results section of the review. If the conclusion was consistent with the empirical results, the review was considered as showing no spin. If it was inconsistent, the review was rated as showing spin. Two researchers (KL, JOS), who both were blind to the author names of the review as well as the Journal having published the review, independently assessed review conclusions and results and rated whether a spin in review conclusions was present or not. If no consensus was achieved, disagreements were resolved by a third person (JB). Kappa statistics showed substantial inter-rater reliability (k = 0.70; agreement 87%).

Statistical analyses

The percentage of disclosed COI, researcher allegiance and reviews with spin was calculated. For the first two indicators, the number of reviews was the denominator, the latter indicator was calculated with the number of studies as denominator. The association of researcher allegiance with a spin in the conclusion of reviews is presented as Odds ratio with 95% confidence interval. The same procedure was used for the association of the inclusion of own primary studies of the authors in the review and the disclosure of COI with a spin in the review.

Results

Our search yielded 936 references. After screening and retrieving full text articles, 95 reviews remained which met our inclusion criteria. A detailed flow chart with a schedule of the reasons for exclusions is found in Fig. 1. The reviews and meta-analyses addressed anxiety disorders (n = 42), depressive disorders (n = 48), and/or personality disorders (n = 13) and allowed conclusions about the following interventions: 59 reviews compared psychological therapies with other forms of psychological therapies, and 36 compared psychological therapies with pharmacological interventions.

- Insert Fig. 1 about here -

Required COI disclosure by journal and disclosed COI

The references of the 95 reviews included in this study are listed in Supplement Table 3. Supplement Table 4 gives an overview how many reviews were published per year in which journal. 40 of the 50 journals regularly requested a disclosure of COI at the time of publication of the respective review. Supplement Table 5 demonstrates which journal asked for which kind of COI disclosure in the respective year of publication of the review article. In sum: Of the 50 publishing journals, 40 requested a disclosure of financial COI (80%), 28 of personal COI (56%), and 17 of non-financial COI (34%).

In 37 of 95 reviews (38.9%), the authors disclosed that no competing interests exist. Authors in 25 of 95 reviews (26.3%) made COI statements as follows: Own study included in the review (n = 2), research activities in relation to one psychological therapy (n = 2), research support (n = 18), author has served as consultant (n = 4), served as speaker on congresses (n = 1), get honoraria (n = 5), have holdings (n = 2), have patents (n = 1), served as a trainer for a psychological therapy (n = 1), being influenced as employer (n = 1). In other words, financial, non-financial, and personal COI were disclosed in 22 reviews (23.1%), 4 reviews (4.2%), and 1 review (1%), respectively. One of the disclosures of financial COI was given in a Journal which does not request declaration of COI; the non-financial and personal COI were all given in Journals requesting such disclosures. In 33 of 95 reviews (34.7%) no COI statement was made.

Inclusion of own studies into the reviews and researcher allegiance

We also looked at the frequency of the inclusion of own primary studies into the review and the allegiance of the researcher. 34 of 95 reviews (35.8%) included at least one primary study of one of the review authors. In sum, 86 primary studies (all addressing psychological therapies) were identified which were included in 34 reviews (see Supplement Table 6 for references of these included studies). 20 reviews included 1 study, 4 reviews 6 studies, 4 reviews 3 studies, 4 reviews 2 studies, 1 review 4 studies and 1 review 18 studies. In 15 of the 34 reviews which included at least one own primary study, we found a researcher allegiance.

Since both the inclusion of own primary studies and researcher allegiance can be described as non-financial COI, we further assessed the disclosure of such COI in relation to the requests of the journal to declare non-financial COI. Regarding the inclusion of own studies into the review, we found: Of 34 reviews including own primary studies, inclusion of own studies by review authors was declared in 2 reviews according to the policy of the journal which specifically asked for inclusion of own studies, was not declared in 16 reviews published in journals requesting the disclosure of non-financial COI (but not defining inclusion of own studies as non-financial COI specifically), and was not declared in 16 reviews published in journals not requesting the disclosure of non-financial COI at all. Regarding researcher allegiance, we found that researcher allegiance was never disclosed: Of 15 reviews with a researcher allegiance, researcher allegiance was not declared in 9 reviews published in journals requesting the disclosure of non-financial COI (but not defining researcher allegiance as non-financial COI specifically), and was not declared in 6 reviews published in journals not requesting the disclosure of non-financial COI at all.

Spin in review conclusions

Spin in the interpretation of review results was rated to be present in 27 of 95 reviews (28%). Within the 36 reviews comparing psychological therapies to pharmacological interventions, 9 (25%) showed a spin. In reviews comparing psychological therapies and pharmacological interventions, spin in favour of a specific psychological therapy was more often present as compared to spin in favour of a pharmacological intervention (Fig. 2). Reviews with a favourable conclusion about psychological therapies (vs. pharmacological interventions) are at high risk for a spin in conclusions (OR = 8.31 [1.41 to 49.05]), whereas favourable conclusions about effects of pharmacological interventions showed no spin in our sample (OR = 1.00 [0.16 to 6.14]. Also the conclusion of equal effects of psychological therapies and pharmacological interventions does not face a risk of spin (OR = 0.12 [0.01 to 1.08]. The conclusion of the equality of effects of psychological therapies, however, showed a trend for a spin, which means that for the primary

outcome of interest the review more often states equality despite inequality of treatment effects (OR = 2.69 [0.86 to8.41].

- Insert Fig. 2 about here -

We further explored whether spin in review conclusions is associated with a disclosed COI, the inclusion of own primary studies of the authors or the researcher allegiance of the authors. To do so, we first investigated these associations in all 95 reviews (Tab. 1). Conclusions with spin were not associated to disclosed COI. However, spin in conclusions was associated in trend to the inclusion of own studies in the systematic review. Reviews with inclusion of own primary studies showed more often spin than reviews without inclusion of own primary studies of the review authors (OR = 2.08 [CI 0.83 to 5.18] p = .11; Tab. 1). The odds for spin in conclusions in systematic reviews including studies with researcher allegiance was similarly increased, but statistically non-significant (OR=2.63[0.84 to 8.12], p = .16; Tab. 1).

- Insert Tab. 1 about here -

Since we were especially interested in spin in favour of psychological therapies, we also investigated whether spin in review conclusions in favour of psychological therapies is associated with a disclosed COI, the inclusion of own primary studies of the authors or the researcher allegiance of the authors (Tab. 2). However, none of the associations were statistically significant or showed trends.

- Insert Tab. 2 about here -

Discussion

This study is – at least to our knowledge - the first that systematically assessed the extent and nature of reporting of financial and non-financial COI in systematic reviews of psychological

therapies and that investigated how often these conflicts are disclosed and whether they may lead to spin in review conclusions. Financial and non-financial COI were disclosed only in 23.1% and 4.2% of the reviews, respectively, although non-financial COI were much more often detectable: Review authors had included 86 own studies in approximately 1/3rd of the reviews and authors of at least 16% of the reviews had allegiance for the evaluated psychological therapy. Spin in review conclusions was found in 27 of 95 reviews (28%) and was associated in trend to a non-financial COI, i.e. the inclusion of own primary studies in the systematic review.

Disclosure of financial, non-financial and personal COI

The disclosure of financial COI was requested by 80% of the journals which published the reviews in our study, but only 22 reviews (23.2%) disclosed any financial COI. This may be explained by two reasons: Firstly, systematic reviews focussing on effectiveness of psychological therapies are most often written by psychologists who have rather seldom financial ties to pharmaceutical companies as compared to physicians who often show these relationships[3-7], and secondly, the minority of reviews (36 of 95 reviews) compared psychological therapies to pharmacological interventions (in 10 of those reviews, financial COI were disclosed). Although psychologists may mostly judge themselves as free of financial COI, however, researcher allegiance as well as the inclusion of own studies into a review (which we both rated as non-financial COI) may well lead to financial gains indirectly.[15] Since psychologists who develop new psychological treatments are often the ones who distribute and train other psychologists in those therapies, the demonstration of effectiveness of a specific psychotherapy in a review may potentially lead to high financial incentives. The promotion of the respective therapy might be easier and the number of trained psychotherapists with high course fee increases. Showing the effectiveness of a treatment can be also an important step for patents and for the implementation in treatment guidelines. The fact that researchers developing and evaluating the effectiveness of psychological therapies are mostly allied to a specific psychotherapy (e.g. cognitive behavioural therapy or psychoanalysis), makes the issue of COI in psychology therapy research very complex and much more complicated than in pharmacological

research. Psychologists who realize that the effect of the therapy to which they are allied is less beneficial than another therapy cannot easily switch to another therapy – in contrast to a medical doctor who can directly prescribe another drug if a drug proves to be less effective than previously thought. Therefore, researcher allegiance might be present in primary studies in any case to some extent, but needs to be carefully declared in systematic reviews.

Non-financial COI were disclosed only in a very small number of reviews (4.2%) although non-financial COI such as the inclusion of own primary studies of the review authors (in 34 of 95 reviews) and researcher allegiance (in 15 of 95 reviews) were detectable in a considerable number of them. This low disclosure rate may be explained by three factors: Firstly, only a minority of journals (34% at the time of assessment) requests a disclosure of non-financial COI – and all 4 declarations of non-financial COI were done in these journals; secondly, only two journals (Perm J, Cochrane Database Syst Rev) specifically asked the authors for the inclusion of own primary studies and only two others (Psychol Trauma, J Psychiatr Res) asked for circumstances related to the presence of researcher allegiance at the point of our assessment; thirdly, researchers may not see the necessity to declare such COI although present and requested by the journal asking for non-financial COI. We conclude from this finding that the necessity to declare non-financial COI should be made more transparent in journal articles. The following strategies may be effective: Journals should consequently ask their authors to disclose any non-financial COI, should exactly define such conflicts and should include examples of common causes of non-financial COI such as the inclusion of own primary studies into review articles or researcher allegiance. Even the International Committee of Medical Journal Editors (ICMJE) mainly focuses on financial COI and their disclosure but gives little emphasis on and advice to the disclosure of non-financial COI.

Similar to non-financial COI, also personal COI were very seldom disclosed (only in one review). This is probably due to the common definition of personal COI meaning any relationship to a person working in a pharmaceutical company. This of course is a less relevant COI for psychotherapist assessing treatment effects of psychological therapies. However, psychotherapists, especially the ones who develop new therapies, are very often personally

involved in institutes promoting the distribution and training of new psychological therapies. Such personal COI may indirectly lead to considerable financial gains.

Spin in review conclusions

Previous research of our group and others has identified different risks increasing the likelihood of bias in psychotherapeutic outcome research.[21 24] In our study, we investigated whether researcher allegiance, an important risk factor of moderate effect size[21], the inclusion of own primary studies into the review or any declared COI may be associated to spin in review conclusions, which we found in 27 of the 95 reviews. Both reviews with inclusion of own primary studies and reviews with researcher allegiance showed more often a spin (statistical trend). Since researcher allegiance has been shown to be significantly related to outcome of psychological therapies[21], authors should be transparent in disclosing their own psychotherapeutic training background and the inclusion of own outcome studies in systematic reviews to make an assessment of COI and allegiance easier. The allegiance indicators of our study might be an initial step for such a statement (development of treatment or basic research on the etiological model for a specific treatment).

Shortcomings

This study has several shortcomings. Firstly, we restricted our search to systematic reviews and meta-analyses of anxiety disorders, personality disorders and major depressive disorders. This may limit the generalizability of our findings. Secondly, our study is limited to published reports from 2010 onwards. This limits generalizability to earlier reviews, but is justified since COI reporting has become more regular nowadays and authors might not have been asked for a COI statement in earlier submissions. Thirdly, our indicators of COI and allegiance are based on publications and reporting quality on some indicators was rather low. The inter-rater reliability of both ratings might be much better if reporting standards in journals would be implemented.

Fourth, we only checked the disclosed COI, but did not investigate whether authors might have more COI than the disclosed ones. We also did not investigate which authors of a review might be responsible for the evaluation and interpretation of studies addressing different types of interventions (i.e. pharmacotherapy and psychotherapy), since such investigations are at high risk of being inaccurate and incomplete.

Conclusions and suggestions for the management of COI in psychotherapy outcome research

We conclude that non-financial COI, especially the inclusion of own primary studies into reviews and researcher allegiance, are frequently seen in systematic reviews of psychological therapies and need more transparency. Most policies and Journal requirements for COI disclosure focus on the importance of financial COI for risks of bias and fail to capture the risk of spin associated with an allegiance. Therefore, if Journals place more emphasis on the declaration of non-financial COI, declaration rates of non-financial COI by authors will most likely increase. If spin effects of non-financial COI in psychotherapy outcome research are confirmed in further studies, journals should do more than simply providing transparency of COI in order to better manage the impact of COI on research outcomes and publications [15]. Strategies to mitigate biases may include the detection and removal of spin at the editorial stage, using independent authors and reviewers interpreting the findings of meta-analyses, the rejection of systematic reviews that demonstrate selective citation biases, and providing free access to all data of systematic reviews to ensure that systematic reviews can be more easily replicated.

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Contributorship statement

KL designed the study, analysed data, monitored study extraction, data analysis and interpretation, and drafted and revised the paper. He is guarantor. JOS and NR extracted and analysed data and revised the draft of the manuscript, JSW analysed data and revised the draft of the manuscript. JB analysed data, monitored study extraction, data analysis and interpretation, and revised the paper. All authors gave final approval of the version to be published. All authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Transparency declaration

The guarantor affirms that the manuscript is an honest, accurate, and transparent account of the study being reported and that no important aspects of the study have been omitted.

Declaration of competing interests

All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: no support from any organisation for the submitted work; KL and JB are active in research on conflicts of interest in medicine and psychology, and JB was involved in the development of indicators of allegiance. All authors declare that they had no financial or personal relationships with pharmaceutical companies within the last 3 years. KL, NR, JSW and JB are psychotherapists trained in CBT, KL and NR also in schematherapy. NR and JB, but not KL and JSW, did receive money from institutes providing training in schematherapy and CBT within the last three years. JSW and KL are coauthors on two reviews included into the study (Gibbon et al., 2010 and Stoffers et al., 2012), and NR and KL are coauthors on one primary study (Reiss et al., 2014) included in one of the reviews.

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Data sharing statement

No additional data available.

References

1. Thompson DF. The Challenge of Conflict of Interest in Medicine. Z Evid Fortbild Qual Gesundhwes 2009;**103**(3):136-40.
2. Lo B, Fields (ed.) *Conflict of Interest in Medical Research, Education, and Practice*, Institute of Medicine 2009.
3. Campbell EG. Doctors and drug companies - scrutinizing influential relationships. N Engl J Med 2007;**357**(18):1796-7.
4. Campbell EG, Rao SR, DesRoches CM, et al. Physician professionalism and changes in physician-industry relationships from 2004 to 2009. Arch Intern Med 2010;**170**(20):1820-6.
5. Campbell EG, Weissman JS, Ehringhaus S, et al. Institutional academic industry relationships. JAMA 2007;**298**(15):1779-86.
6. Lieb K, Brandtönies S. A survey of german physicians in private practice about contacts with pharmaceutical sales representatives. Dt Arztebl Int 2010;**107**(22):392.
7. Lieb K, Scheurich A. Contact between Doctors and the Pharmaceutical Industry, Their Perceptions, and the Effects on Prescribing Habits. PloS one 2014;**9**(10):e110130.
8. Bekelman JE, Li Y, Gross CP. Scope and impact of financial conflicts of interest in biomedical research: a systematic review. JAMA 2003;**289**(4):454-65.
9. Schott G, Pachl H, Limbach U, et al. The financing of drug trials by pharmaceutical companies and its consequences. Part 1: a qualitative, systematic review of the literature on possible influences on the findings, protocols, and quality of drug trials. Dt Arztebl Int 2010;**107**(16):279-85.
10. Wang AT, McCoy CP, Murad MH, et al. Association between industry affiliation and position on cardiovascular risk with rosiglitazone: cross sectional systematic review. BMJ 2010;**340**:c1344.
11. Dunn AG, Arachi D, Hudgins J, et al. Financial conflicts of interest and conclusions about neuraminidase inhibitors for influenza: an analysis of systematic reviews. Ann Intern Med 2014;**161**(7):513-8.
12. Roest AM, de Jonge P, Williams CD, et al. Reporting Bias in Clinical Trials Investigating the Efficacy of Second-Generation Antidepressants in the Treatment of Anxiety Disorders: A Report of 2 Meta-analyses. JAMA psychiatry 2015;**72**(5):500-10.
13. Roseman M, Milette K, Bero LA, et al. Reporting of conflicts of interest in meta-analyses of trials of pharmacological treatments. JAMA 2011;**305**(10):1008-17.
14. Roseman M, Turner EH, Lexchin J, et al. Reporting of conflicts of interest from drug trials in Cochrane reviews: cross sectional study. BMJ 2012;**345**:e5155.
15. Clark AM, Choby A, Ainsworth K, et al. Addressing conflict of interest in non-pharmacological research. Int J Clin Pract. 2015;**69**(3):270-2.
16. Leykin Y, DeRubeis RJ. Allegiance in Psychotherapy Outcome Research: Separating Association From Bias. 2009.
17. Lambert MJ. Are differential treatment effects inflated by researcher therapy allegiance? Could Clever Hans count? Clinical Psychology: Science and Practice 1999;**6**(1):127-30.
18. Gaffan EA, Tsaousis I, Kemp-Wheeler SM. Researcher allegiance and meta-analysis: the case of cognitive therapy for depression. J Consult Clin Psychol. 1995;**63**(6):966-80.
19. Munder T, Gerger H, Trelle S, et al. Testing the allegiance bias hypothesis: a meta-analysis. Psychother Res 2011;**21**(6):670-84.
20. Miller S, Wampold B, Varhely K. Direct comparisons of treatment modalities for youth disorders: a meta-analysis. Psychother Res 2008;**18**(1):5-14.
21. Munder T, Brutsch O, Leonhart R, et al. Researcher allegiance in psychotherapy outcome research: an overview of reviews. Clin Psychol Rev 2013;**33**(4):501-11.

22. Munder T, Fluckiger C, Gerger H, et al. Is the allegiance effect an epiphenomenon of true efficacy differences between treatments? a meta-analysis. J Couns Psychol 2012;**59**(4):631-7.
23. Cuijpers P, Driessen E, Hollon SD, et al. The efficacy of non-directive supportive therapy for adult depression: a meta-analysis. Clin Psychol Rev 2012;**32**(4):280-91.
24. Cuijpers P, van Straten A, Bohlmeijer E, et al. The effects of psychotherapy for adult depression are overestimated: a meta-analysis of study quality and effect size. Psychol Med 2010;**40**(2):211-23.

Tables

Tab. 1 Association between disclosed COI and other forms of COI (i.e. inclusion of primary studies in reviews, researcher allegiance) and spin in review conclusions in all 95 reviews.

	Review with spin in conclusion	Review without spin in conclusion	Odds Ratio [95% confidence interval]
Inclusion of own primary study	13	21	2.08 [0.83 to 5.18]
No inclusion of own primary study	14	47	
Researcher allegiance	7	8	2.63 [0.84 to 8.16]
No researcher allegiance	20	60	
COI disclosed	9	16	1.63 [0.61 to 4.32]
No COI disclosed	18	52	
Inclusion of own primary study, researcher allegiance and/or COI declared	16	31	1.74 [0.70 to 4.29]
None of the three	11	37	

Tab. 2: Association between disclosed COI and other forms of COI (i.e. inclusion of primary studies in reviews, researcher allegiance) and spin in review conclusions in the reviews rated as having spin in favour of psychological therapies as compared to all other reviews.

	Review rated as "spin" in favour of psychological therapies	Review rated as "no spin" or "spin" against psychological therapies	Odds Ratio [95% confidence interval]
Inclusion of own primary study	6	28	1.24 [0.40 to 3.83]
No inclusion of own primary study	9	52	
Researcher allegiance	2	13	0.79 [0.16 to 3.94]
No researcher allegiance	13	67	
COI disclosed	4	21	1.02 [0.29 to 3.56]
No COI disclosed	11	59	
Inclusion of own primary study, researcher allegiance and/or COI disclosed	7	40	0.88 [0.29 to 2.64]
None of the three	8	40	

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Figure 1: Flow chart of study selection

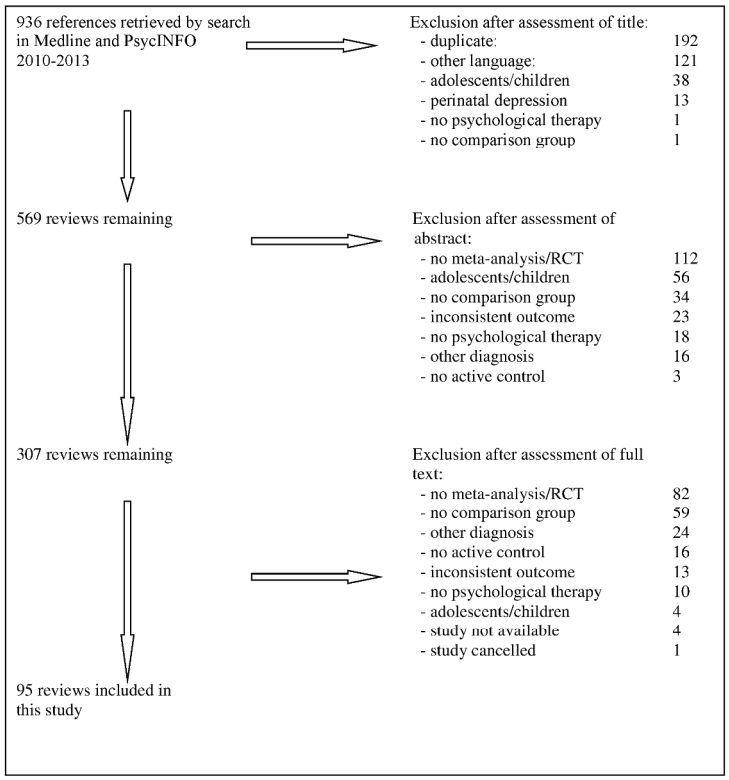

Fig. 1
210x297mm (300 x 300 DPI)

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Figure 2: Risk of spin in review conclusions in comparisons of different treatments (Tx1 vs. Tx2).

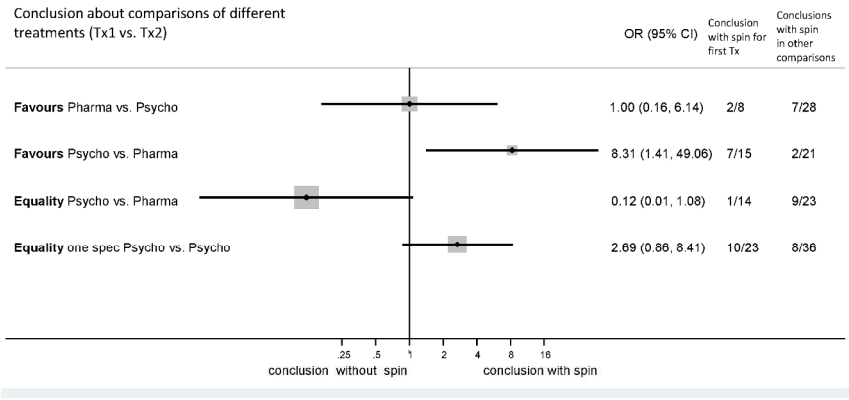

Fig. 2
210x297mm (300 x 300 DPI)

Supplements

Conflicts of interest and bias in systematic reviews of psychological therapies

Revision to BMJ Open

Klaus Lieb, Jan von der Osten-Sacken, Jutta Stoffers-Winterling, Neele Reiss, Jürgen Barth

Supplement Table 1: MEDLINE EBSCO exact search strategy (last run on February 3rd, 2014)

#	
S1	(MH “Psychotherapy+”)
S2	(MH “Anxiety Disorders+”)*
S3	(S1 AND S2)
S4	(S1 AND S2) – Date of publication: 20100101-20131231; Publication Type: Meta-Analysis, Review

* This search is exemplary for anxiety disorders. Separate searches were done for depressive and personality disorders, using controlled vocabulary (MH “Depressive Disorders+”) or (MH “Personality Disorders+”), resp.

Supplement Table 2: PsycINFO EBSCO exact search strategy (last run on February 3rd, 2014)

#	
S1	DE "Psychotherapy" OR DE "Adlerian Psychotherapy" OR DE "Adolescent Psychotherapy" OR DE "Analytical Psychotherapy" OR DE "Autogenic Training" OR DE "Behavior Therapy" OR DE "Brief Psychotherapy" OR DE "Brief Relational Therapy" OR DE "Child Psychotherapy" OR DE "Client Centered Therapy" OR DE "Cognitive Behavior Therapy" OR DE "Conversion Therapy" OR DE "Eclectic Psychotherapy" OR DE "Emotion Focused Therapy" OR DE "Existential Therapy" OR DE "Experiential Psychotherapy" OR DE "Expressive Psychotherapy" OR DE "Eye Movement Desensitization Therapy" OR DE "Feminist Therapy" OR DE "Geriatric Psychotherapy" OR DE "Gestalt Therapy" OR DE "Group Psychotherapy" OR DE "Guided Imagery" OR DE "Humanistic Psychotherapy" OR DE "Hypnotherapy" OR DE "Individual Psychotherapy" OR DE "Insight Therapy" OR DE "Integrative Psychotherapy" OR DE "Interpersonal Psychotherapy" OR DE "Logotherapy" OR DE "Narrative Therapy" OR DE "Network Therapy" OR DE "Persuasion Therapy" OR DE "Primal Therapy" OR DE "Psychoanalysis" OR DE "Psychodrama" OR DE "Psychodynamic Psychotherapy" OR DE "Psychotherapeutic Counseling" OR DE "Rational Emotive Behavior Therapy" OR DE "Reality Therapy" OR DE "Relationship Therapy" OR DE "Solution Focused Therapy" OR DE "Supportive Psychotherapy" OR DE "Transactional Analysis"
S2	DE "Anxiety Disorders" OR DE "Acute Stress Disorder" OR DE "Castration Anxiety" OR DE "Death Anxiety" OR DE "Generalized Anxiety Disorder" OR DE "Obsessive Compulsive Disorder" OR DE "Panic Disorder" OR DE "Phobias" OR DE "Posttraumatic Stress Disorder" OR DE "Separation Anxiety"
S3	(S1 AND S2)
S4	(S1 AND S2) – Published date: 20100101-20131231; Methodology: -Systematic Review, -Meta Analysis

* This search is exemplary for anxiety disorders. Separate searches were done for depressive and personality disorders, using controlled vocabulary (DE "Major Depression" OR DE "Anaclitic Depression" OR DE "Dysthymic Disorder" OR DE "Endogenous Depression" OR DE "Postpartum Depression" OR DE "Reactive Depression" OR DE "Recurrent Depression" OR DE "Treatment Resistant Depression") or (DE "Personality Disorders" OR DE "Antisocial Personality Disorder" OR DE "Avoidant Personality Disorder" OR DE "Borderline Personality Disorder" OR DE "Dependent Personality Disorder" OR DE "Histrionic Personality Disorder" OR DE "Narcissistic Personality Disorder" OR DE "Obsessive Compulsive Personality Disorder" OR DE "Paranoid Personality Disorder" OR DE "Passive Aggressive Personality Disorder" OR DE "Sadomasochistic Personality" OR DE "Schizoid Personality Disorder" OR DE "Schizotypal Personality Disorder"), resp.

Supplement Table 3: References of the 95 reviews included in this study

Abbass A, Town J, Driessen E. Intensive short-term dynamic psychotherapy: A systematic review and meta-analysis of outcome research. Harv Rev Psychiatry 2012;20(2):97-108.

Abbass A, Town J, Driessen E. The efficacy of short-term psychodynamic psychotherapy for depressive disorders with comorbid personality disorder. Psychiatry 2011;74(1):58-71.

Baardseth TP, Goldberg SB, Pace BT, et al. Cognitive-behavioral therapy versus other therapies: Redux. Clin Psychol Rev 2013;33(3):395-405.

Barker-Collo S, Starkey N, Theadom A. Trearment for depression following mild traumatic brain injury in adults: A meta-analysis. Brain Inj 2013;27(10):1124-1133.

Bartley CA, Hay M, Bloch MH. Meta-analysis: Aerobic exercise for the treatment of anxiety disorders. Prog Neuropsychopharmacol Biol Psychiatry 2013;45:34-39.

Barrera TL, Mott JM, Hofstein RF, et al. A meta-analytic review of exposure in group cognitive behavioral therapy for posttraumatic stress disorder. Clin Psychol Rev 2013;33(1):24-32.

Beltman MW, Oude Voshaar RC, Speckens AE. Cognitive-behavioural therapy for depression in people with a somatic disease: meta-analysis of randomized controlled trials. Br J Psychiatry 2010;197(1):11-19.

Bomyea J, Lang AJ. Emerging interventions for PTSD: Future directions for clinical care and research Neuropharmacology 2012;62:607-616.

Bontempo A, Panza KE, Bloch MH. Meta-Analysis: D-cycloserine Augmentation of Behavioral Therapy for the Treatment of Anxiety Disorders. J Clin Psychiatry 2012;73(4):533–537.

Budge SL, Moore JT, Del Re AC, et al. The effectiveness of evidence-based treatments for personality disorders when comparing treatment-as-usual and bona fide treatments. Clin Psychol Rev 2013;33:1057–1066.

Busch FN, Sandberg LS. Combined treatment of depression
Psychiatr Clin North Am 2012;35:165-179.

Casement MD, Swanson LM. A meta-analysis of imagery rehearsal for post-trauma nightmares: Effects on nightmare frequency, sleep quality, and posttraumatic stress. Clin Psychol Rev 2012;32:566–574.

Chard KM, Ricksecker EG, Healy ET, et al. Dissemination and experience with cognitive processing therapy. J Rehabil Res Dev 2012;49(5):667-78.

Chen KW, Berger CC, Manheimer E, et al. Meditative therapies for reducing anxiety: A systematic review and meta-analysis of randomized controlled trials. Dedress Anxiety 2012;29:545–562.

Chugh-Gupta N, Baldassarre FG, Vrkljan BH. A systematic review of yoga for state anxiety: Considerations for occupational therapy. Can J Occup Ther 2013;80(3):150-170.

Cody RA, Drysdale K. The Effects of Psychotherapy on Reducing Depression in Residential Aged Care: A Meta-Analytic Review. Clin Gerontol 2013;36(1):46-69.

Cuijpers P, Andersson G, Donker T, et al. Psychological treatment of depression: Results of a series of meta-analyses Nord J Psychiatry 2011;65(6):354-364.

Cuijpers P, Berking M, Andersson G, et al. A Meta-Analysis of Cognitive-Behavioral Therapy for Adult Depression, Alone and in Comparison With Other Treatments. Can J Psychiatry 2013;58(7):376-385.

Cuijpers P, Clignet F, van Meijel B, et al. Psychological treatment of depression in inpatients: a systematic review and meta-analysis. Clin Psychol Rev 2011;31(3):353-360.

Cuijpers P, de Beurs DP, van Spijker BA, et al. The effects of psychotherapy for adult depression on suicidality and hopelessness: A systematic review and meta-analysis. J Affect Disord 2013;144(3):183-190.

Cuijpers P, Driessen E, Hollon SD, et al. The efficacy of non-directive supportive therapy for adult depression: A meta-analysis. Clin Psychol Rev 2012;32:280–291.

Cuijpers P, Geraedts AS, van Oppen P, et al. Interpersonal Psychotherapy for Depression: A Meta-Analysis. Am J Psychiatry 2011;168:581–592.

Cuijpers P, Huibers M, Ebert DD, et al. How much psychotherapy is needed to treat depression? A metaregression analysis. J Affect Disord 2013;149(1-3):1-13.

Cuijpers P, Reynolds III CF, Donker T, et al. Personalized treatment of adult depression: Medication, psychotherapy, or both? A systematic review. Depress Anxiety 2012;29:855–864.

Cuijpers P, van Straten A, Hollon SD, et al. The contribution of active medication to combined treatments of psychotherapy and pharmacotherapy for adult depression: a meta-analysis Acta Psychiatr Scand 2010;121:415–423.

Cuijpers P, van Straten A, Schuurman J, et al. Psychotherapy for chronic major depression and dysthymia: A meta-analysis Clin Psychol Rev 2010;30:51–62.

Daigle MS, Pouliot L, Chagnon F, et al. Suicide attemps: Prevention of repetition. Can J Psychiatry 2011;56(10):621-629.

Dickens C, Cherrington A, Adeyemi I, et al. Characteristics of Psychological Interventions That Improve Depression in People With Coronary Heart Disease: A Systematic Review and Meta-Regression. Psychosom Med 2013;75:211-221.

Dossa NI, Hatem M. Cognitive-Behavioral Therapy versus Other PTSD Psychotherapies as Treatment for Women Victims of War-Related Violence: A Systematic Review. Scientific World Journal 2012;2012:181847. doi:10.1100/2012/181847. Epub 2012 Apr 19.

Driessen E, Cuijpers P, de Maat SCM, et al. The efficacy of short-term psychodynamic psychotherapy depression: a meta-analysis. Clin Psychol Rev 2010;30(1):25-36.

Ekers D, Webster LAD. An overview of the effectiveness of psychological therapy for depression and stepped care service delivery models. J Res Nurs 2013;18(2):171-184,

Faller H, Schuler M, Richard M, et al. Effects of psycho-oncologic interventions on emotional distress and quality of life in adult patients with cancer: systematic review and meta-analysis. J Clin Oncol 2013;31(6):782-93.

Feng CY, Chu H, Chen CH, et al. The Effect of Cognitive Behavioral Group Therapy for Depression: A Meta-Analysis 2000–2010. Worldviews Evid Based Nurs 2012;9(1):2-17.

Fritzsche A, Clamor A, von Leupoldt A. Effects of medical and psychological treatment of depression in patients with COPD e A review Respir Med 2011;105:1422-1433.

Gibbon S, Duggan C, Stoffers J, et al. Psychological interventions for antisocial personality disorder. Cochrane Database Syst Rev 2010;6: CD007668. doi:10.1002/14651858.CD007668.pub2.

Goncalves DC, Byrne GJ. Interventions for generalized anxiety disorder in older adults: Systematic review and meta-analysis J Anxiety Disord 2012;26:1–11.

Goodson J, Helstrom A, Halpern JM, et al. Treatment of posttraumatic stress disorder in US combat veterans: a meta-analytic review. Psychol Rep 2011;109(2):573-599.

Gould RL, Coulson MC, Howard RJ. Efficacy of Cognitive Behavioral Therapy for Anxiety Disorders in Older People: A Meta-Analysis and Meta-Regression of Randomized Controlled Trials. J Am Geriatr Soc 2012;60(2):218-29. DOI: 10.1111/j.1532-5415.2011.03824.xJAGS 60:218–229, 2012.

Guidi J, Fava GA, Fava M, et al. Efficacy of the sequential integration of psychotherapy and pharmacotherapy in major depressive disorder: a preliminary meta-analysis. Psychol Med 2011;41:321–331.

Gwozdziewycz N, Mehl-Madrona L. Meta-analysis of the use of narrative exposure therapy for the effects of trauma among refugee populations. Perm J 2013;17(1):70-76.

Hanrahan F, Field AP, Jones FW, et al. A meta-analysis of cognitive therapy for worry in generalized anxiety disorder. Clin Psychol Rev 2013;33(1):120-32.

Hans E, Hiller W. Effectiveness of and Dropout From Outpatient Cognitive Behavioral Therapy for Adult Unipolar Depression: A Meta-Analysis of Nonrandomized Effectiveness Studies. J Consult Clin Psychol 2013;81(1):75•88.

Hansen K, Höfling V, Kröner-Borowik T, et al. Efficacy of psychological interventions aiming to reduce chronic nightmares: a meta-analysis. Clin Psychol Rev 2013;33(1):146-55.

Hart SL, Hoyt MA, Diefenbach M, et al. Meta-Analysis of Efficacy of Interventions for Elevated Depressive Symptoms in Adults Diagnosed With Cancer. J Natl Cancer Inst 2012;104:990–1004.

Haug T, Nordgreen T, Öst LG, et al. Self-help treatment of anxiety disorders: A meta-analysis and meta-regression of effects and potential moderators Clin Psychol Rev 2012;32:425–445.

Hetrick SE, Purcell R, Garner B, et al. Combined pharmacotherapy and psychological therapies for post traumatic stress disorder (PTSD) Cochrane Database Syst Rev 2010;7:CD007316. DOI:10.1002/14651858.CD007316.pub2.

Ho MSK, Lee CW. Cognitive behaviour therapy versus eye movement desensitization and reprocessing for post-traumatic disorder – is it all in the homework then? Eur Rev Appl Psychol 2012;62:253–260.

Hobbs JDJ, Kushner MG, Lee SS, et al. Meta-analysis of Supplemental Treatment for Depressive and Anxiety Disorders in Patients Being Treated for Alcohol Dependence. Am J Addict 2011;20:319–329.

Hofmann SG, Sawyer AT, Witt AA, et al. The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. J Consult Clin Psychol 2010;78(2):169-183.

Huntley AL, Araya R, Salisbury C. Group psychological therapies for depression in the community: systematic review and meta-analysis. Br J Psychiatry 2012;200:184–190. doi: 10.1192/bjp.bp.111.092049

Imel ZE, Laska, K, Jakupcak M, et al. Meta-Analysis of Dropout in Treatments for Posttraumatic Stress Disorder. J Consult Clin Psychol 2013;81(3)394-404.

IsHak WW, Ha K, Kapitanski N, et al. The Impact of Psychotherapy, Pharmacotherapy, and Their Combination on Quality of Life in Depression. Harv Rev Psychiatry 2011;19:277–289.

Jakobsen JC, Hansen JL, Simonsen E, et al. The effect of adding psychodynamic therapy to antidepressants in patients with major depressive disorder. A systematic review of randomized clinical trials with meta-analyses and trial sequential analyses J Affect Disord 2012;137:4–14.

Jakobsen JC, Hansen JL, Simonsen S, et al. Effects of cognitive therapy versus interpersonal psychotherapy in patients with major depressive disorder: a systematic review of randomized clinical trials with meta-analyses and trial sequential analyses. Psychol Med 2012;42:1343–1357. doi:10.1017/S0033291711002236.

Krishna M, Honagodu A, Rajendra R, et al. A systematic review and meta-analysis of group psychotherapy for sub-clinical depression in older adults. Int J of Geriatr Psychiatry 2013;28(9):881-888.

Krishna M, Jauhari A, Lepping P, et al. Is group psychotherapy effective in older adults with depression? A systematic review. Int J of Geriatr Psychiatry. 2011;26(4):331-340.

Leisenring F, Rabung S. Long-term psychodynamic psychotherapy in complex mental disorders: update of a meta-analysis. Br J Psychiatry 2011;199(1):15-22.

Luciano M, Del Vecchio V, Giacco D, et al. A 'family affair'? The impact of family psychoeducational interventions on depression Expert Rev. Neurother 2012;12(1):83–92.

Markowitz SM, Gonzalez JS, Wilkinson JL, et al. A Review of Treating Depression in Diabetes: Emerging Findings. Psychosomatics 2011;52:1–18.

Mavrides N, Nemeroff C. Treatment of depression in cardiovascular disease. Depress Anxiety 2013;30(4):328-41.

Nenova M, Morris L, Paul L, et al. Psychosocial Interventions With Cognitive-Behavioral Components for the Treatment of Cancer-Related Traumatic Stress Symptoms: A Review of Randomized Controlled Trials. J Cogn Psychother 2013;27(3)258-284.

Nickerson A, Bryant RA, Silove D, et al. A critical review of psychological treatments of posttraumatic stress disorder in refugees. Clin Psychol Rev 2011;31:399–417.

Oestergaard S, Møldrup C. Optimal duration of combined psychotherapy and pharmacotherapy for patients with moderate and severe depression: A meta-analysis. J Affect Disord 2011;131:24–36.

Olatunji BO, Davis ML, Powers MB, et al. Cognitive-behavioral therapy for obsessive-compulsive disorder: A meta-analysis of treatment outcome and moderators. J Psychiatr Res 2013;47(1):33-41.

Opris D, Pintea S, Garcia-Palacios A, et al. Virtual reality exposure therapy in anxiety disorders: A quantitative meta-analysis. Depress Anxiety 2012;29(2):85-93.

Palic S, Elklit A. Psychosocial treatment of post-traumatic stress disorder in adult refugees: a systematic review of prospective treatment outcome studies and a critique. J Affect Disord 2011;131(1-3):8-23.

Piet J, Hougaard E. The effect of mindfulness-based cognitive therapy for prevention of relapse in recurrent major depressive disorder: a systematic review and meta-analysis. Clin Psychol Rev 2011;31(6):1032-1040.

Possemato K, The current state of intervention research for posttraumatic stress disorder within the primary care setting. J Clin Psychol Med Settings 2011;18(3):268-280.

Powers MB, Halpern JM, Ferenschak MP, et al. A meta-analytic review of prolonged exposure for posttraumatic stress disorder. Clin Psychol Rev 2010;30(6):635-641.

Rakofsky JJ, Dunlop BW, Treating Nonspecific Anxiety and Anxiety Disorders in Patients With Bipolar Disorder: A Review. J Clin Psychiatry 2011;72(1):81-91.

Richards D, Richardson T. Computer-based psychological treatments for depression: A systematic review and meta-analysis Clin Psychol Rev 2012;32:329–342.

Rizzo M, Creed F, Goldberg D, et al. A systematic review of non-pharmacological treatments for depression in people with chronic physical health problems. J Psychosom Res 2011;71(1):18-27.

Roberts NP, Kitchiner NJ, Kenardy J, et al. Early psychological interventions to treat acute traumatic stress symptoms. Cochrane Database Syst Rev 2010;3:CD007944. doi:10.1002/14651858.CD007944.pub2.

Rosenberg Edwards A. Psychotherapy and Pharmacotherapy for Social Anxiety Disorder: A Comprehensive Meta-Analysis. Dissertation abstracts international: Section B: the Sciences and Engineering 2011;72(4-B):2433-2601.

Roshanaei-Moghaddam B, Pauly MC, Atkins DC, et al. Relative effects of CBT and pharmacotherapy in depression versus anxiety: Is medication somewhat better for depression, and CBT somewhat better for anxiety? Depress Anxiety 2011;28:560–567.

Samad Z, Brealey S, Gilbody S. The effectiveness of behavioural therapy for the treatment of depression in older adults: a meta-analysis. Int J of Geriatr Psychiatry 2011;26(12):1211-1220.

Sanchez-Meca J, Rosa-Alcázar AI, Marín-Martínez F, et al. Psychological treatment of panic disorder with or without agoraphobia: a meta-analyis. Clin Psychol Rev 2010;30(1):37-50.

Schoenfeld FB, DeViva JC, Manber R. Treatment of sleep disturbances in posttraumatic stress disorder: A review. J Rehabil Res Dev 2012;49(5):729–752.

Sempértegui GA, Karreman A, Arntz A, et al. Schema therapy for borderline personality disorder: a comprehensive review of its empirical foundations, effectiveness and implementation possibilities. Clin Psychol Rev 2013;33(3):426-47.

Sloan DM, Bovin MJ, Schnurr PP. Review of group treatment for PTSD. J Rehabil Res Dev 2012;49(5):689-701.

Sloan DM, Feinstein BA, Gallagher MW, et al. Efficiacy of Group Treatment for Posttraumatic Stress Disorder Symptoms: A Meta-Analysis. Psychol Trauma 2013;5(2):176-183.

Sloan DM, Gallagher MW, Feinstein BA, et al. Efficacy of telehealth treatments for posttraumatic stress-related symptoms: a meta-analysis. Cogn Behav Ther 2011;40(2):111-125.

Spielmans GI, Berman MI, Usitalo AN. Psychotherapy Versus Second-Generation Antidepressants in the Treatment of Depression A Meta-Analysis. J Nerv Ment Dis 2011;199:142–149.

Spijker J, van Straten A, Bockting CL, et al. Psychotherapy, Antidepressants, and Their Combination for Chronic Major Depressive Disorder: A Systematic Review. Can J Psychiatry 2013:58(7):386-392.

Stagg EK, Lazenby M. Best Practices for the Nonpharmacological Treatment of Depression at the End of Life. Am J Hosp Palliat Care 2012;29(3):183-194.

Steenkamp MM, Litz BT Psychotherapy for military-related posttraumatic stress disorder: review of the evidence. Clin Psychol Rev 2013;33(1):45-53.

Stoffers JM, Völlm BA, Rücker G, et al. Psychological therapies for people with borderline personality disorder (Review), Cochrane Database Syst Rev 2012;8:CD005652. doi:10.1002/14651858.CD005652.pub2.

Van Dam D, Vedel E, Ehring T, et al. Psychological treatments for concurrent posttraumatic stress disorder and substance use disorder: A systematic review. Clin Psychol Rev 2012;32:202–214.

Van der Feltz-Cornelis CM, Nuyen J, Stoop C, et al. Effect of interventions for major depressive disorder and significant depressive symptoms in patients with diabetes mellitus: a systematic review and meta-analysis Gen Hosp Psychiatry 2010;32:380–395.

Van der Heiden C. Metacognitions in generalized anxiety disorder: theoretical and practical perspectives. Expert Rev Neurother 2013;13(2):135-141.

Van Emmerik AA, Reijntjes A, Kamphuis JH. Writing Therapy for Posttraumatic Stress: A Meta-Analysis. Psychother Psychosom 2013;82:82-88.

Van Hees ML, Rotter T, Ellermann T, et al. The effectiveness of individual interpersonal psychotherapy as a treatment for major depressive disorder in adult outpatients: A systematic review. BMC Psychiatry 2013;13:22. doi:10.1186/1471-244X-13-22.

Van Straten A, Geraedts A, Verdonck-de Leeuw IM, et al. Psychological treatment of depressive symptoms in patients with medical disorders: a meta-analysis. J Psychosom Res 2010;69(1):23-32.

Vøllestad J, Nielsen MB, Nielsen GH Mindfulness- and acceptance-based interventions for anxiety disorders: A systematic review and meta-analysis. Br J Clin Psychol 2012;51:239–260.

Watts BV, Schnurr PP, Mayo L, et al. Meta-Analysis of the Efficacy of Treatments for Posttraumatic Stress Disorder. J Clin Psychiatry 2013;74(6):541-550.

Supplement Table 4: Journals in which the 95 reviews were published

Journal	2010	2011	2012	2013	Total number
Clin Psychol Rev	4	3	5	8	20
Depress Anxiety	-	1	3	1	5
J Affect Disord	-	2	1	2	5
Cochrane Database Syst Rev	3	-	1	-	4
Br J Psychiatry	1	1	1	-	3
Can J Psychiatry	-	1	-	2	3
Int J of Geriatr Psychiatry	-	2	-	1	3
J Clin Psychiatry	-	1	1	1	3
Expert Rev Neurother	-	-	1	1	2
Harv Rev Psychiatry	-	1	1	-	2
J Consult Clin Psychol	1	-	-	1	2
J Psychosom Res	1	1	-	-	2
Psychol Med	-	1	1	-	2
Acta Psychiatr Scand	1	-	-	-	1
Am J Addict	-	1	-	-	1
Am J Hosp Palliat Care	-	-	1	-	1
Am J Psychiatry	-	1	-	-	1
BMC Psychiatry	-	-	-	1	1
Brain inj	-	-	-	1	1
Br J Clin Psychol	-	-	1	-	1
Can J Occup Ther	-	-	-	1	1
Clin Gerontol	-	-	-	1	1
Cogn Behav Ther	-	1	-	-	1
Dissertations Abstracts international: Section B: The Sciences and Engineering	-	1	-	-	1
Eur Rev Appl Psychol	-	-	1	-	1
Gen Hosp Psychiatry	1	-	-	-	1
J Am Geriatr Soc	-	-	1	-	1
J Anxiety Disord	-	-	1	-	1

J Clin Oncol	-	-	-	1	1
J Clin Psychol Med Settings	-	1	-	-	1
J Cogn Psychother	-	-	-	1	1
J Natl Cancer Inst	-	-	1	-	1
J Nerv Ment Dis	-	1	-	-	1
J Psychiatr Res	-	-	-	1	1
J Rehabil Res Dev	-	-	1	-	1
J Res Nurs	-	-	-	1	1
Neuropharmacology	-	-	1	-	1
Nord J Psychiatry	-	1	-	-	1
Perm J	-	-	-	1	1
Prog Neuropsychopharmacol Biol Psychiatry	-	-	-	1	1
Psychiatr Clin North Am	-	-	1	-	1
Psychiatry	-	1	-	-	1
Psychol Rep	-	1	-	-	1
Psychol Trauma	-	-	-	1	1
Psychosom Med	-	-	-	1	1
Psychosomatics	-	1	-	-	1
Psychother Psychosom	-	-	-	1	1
Respir Med	-	1	-	-	1
Scientific World Journal	-	-	1	-	1
Worldviews Evid Based Nurs	-	-	1	-	1

Supplement Table 5: Mandatory disclosure of Conflicts of Interest by Journal – last accessed June 8, 2014

Journal	Personal COI	Financial COI	Non-Financial COI	Inclusion of own primary study	Researcher allegiance
Acta Psychiatr Scand	no	Yes	No	No	No
Am J Addict	no	Yes	Yes	No	No
Am J Hosp Palliat Care	no	yes	No	No	No
Am J Psychiatry	no	yes	No	No	No
BMC Psychiatry	no	no	No	No	No
Brain Inj	yes	yes	No	No	No
Br J Clin Psychol	no	no	No	No	No
Br J Psychiatry	yes	yes	Yes	No	No
Can J Occup Ther	no	no	No	No	No
Can J Psychiatry	yes	yes	Yes	No	No
Clin Gerontol	no	no	No	No	No
Clin Psychol Rev	yes	yes	Yes	No	No
Cochrane Database Syst Rev	yes	yes	Yes	yes	No
Cogn Behav Ther	no	no	No	No	No
Depress Anxiety	yes	yes	No	No	No
Dissertations Abstracts international: Section B: The Sciences and Engineering	no	no	No	No	No
Eur Rev Appl Psychol	yes	yes	Yes	No	No
Expert Rev Neurother	yes	yes	Yes	No	No
Gen Hosp Psychiatry	yes	yes	Yes	No	No
Harv Rev Psychiatry	yes	yes	No	No	No
Int J of Geriatr Psychiatry	yes	yes	No	No	No
J Affect Disord	yes	yes	Yes	No	No
J Am Geriatr Soc	yes	yes	Yes	No	No

J Anxiety Disord	yes	yes	Yes	No	No
J Clin Oncol	yes	yes	No	No	No
J Clin Psychiatry	yes	yes	No	No	No
J Clin Psychol Med Settings	no	yes	No	No	No
J Cogn Psychother	unclear	unclear	Unclear	Unclear	Unclear
J Consult Clin Psychol	yes	yes	No	No	No
J Natl Cancer Inst	no	yes	No	No	No
J Nerv Ment Dis	yes	yes	Yes	No	No
J Psychiatr Res	yes	yes	No	No	yes
J Psychosom Res	yes	yes	Yes	No	No
J Rehabil Res Dev	yes	yes	No	No	No
J Res Nurs	no	yes	No	No	No
Neuropharmacology	yes	yes	Yes	No	No
Nord J Psychiatry	no	yes	No	No	No
Perm J	yes	yes	No	yes	No
Prog Neuropsychopharmacol Biol Psychiatry	yes	yes	Yes	No	No
Psychiatr Clin North Am	no	yes	No	No	No
Psychiatry	no	no	No	No	No
Psychol Med	yes	yes	No	No	No
Psychol Rep	no	no	No	No	No
Psychol Trauma	yes	yes	Yes	No	yes
Psychosom Med	yes	yes	No	No	No
Psychosomatics	no	yes	No	No	No
Psychother Psychosom	no	yes	No	No	No
Respir Med	yes	yes	Yes	No	No
Scientific World Journal	no	no	No	No	No
Worldviews Evid Based Nurs	no	yes	No	No	No

Supplement Table 6: References of the own primary studies included into 34 reviews by the review authors

Abbass AA, Campbell S, Magee K, et al. Intensive shortterm dynamic psychotherapy to reduce rates of emergency department return visits for patients with medically unexplained symptoms: preliminary evidence from a pre-post intervention study. CJEM 2009;11(6):529–534.

Abbass A. Intensive short-term dynamic psychotherapy in a private psychiatric office: Clinical and cost effectiveness. Am J Psychother 2002;56:225-232.

Abbass A. Intensive short-term dynamic psychotherapy of treatment-resistant depression: a pilot study. Depress Anxiety 2006;23:449–452.

Abbass A. Modified short-term dynamic psychotherapy in patients with bipolar disorder. Preliminary report of a case series. Can Child Psychiatry Rev 2002;11(1):19–22.

Abbass A. Office based research in intensive short-term dynamic psychotherapy (ISTDP): data from the first 6 years of practice. Ad Hoc Bull Short Term Dyn Psychother 2002;6(2):5–14.

Abbass A, Sheldon A, Gyra A, et al. Intensive short-term dynamic psychotherapy for DSM-IV personality disorders. J Nerv Ment Dis 2008;196:211–216.

Abbass A. Small-group videotape training for psychotherapy skill development. Acad Psychiatry 2004;28:151–155.

Andersson G, Waara J, Jonsson U, et al. Internet-based self-help versus one-session exposure in the treatment of spider phobia: a randomized controlled trial. Cogn Behav Ther 2009;38:114-120.

Araya R, Rojas G, Fritsch R, et al. Treating depression in primary care in low-income women in Santiago, Chile: a randomised controlled trial. Lancet 2003;361:995–1000.

Arntz A, Dietzel R, Dreessen L. Assumptions in borderline personality disorder, specificity, stability and relationship with etiological factors. Behav Res Ther 1999;37(6):545–557.

Arntz A, Dreessen L, Schouten E, et al. Beliefs in personality disorders: A test with the Personality Disorder Belief Questionnaire. Behav Res Ther 2004;42(10):1215–1225.

Arntz A, Klokman J, Sieswerda S. An experimental test of the schema mode model of borderline personality disorder. J Behav Ther Exp Psychiatry 2005;36(3):226–239.

Arntz A, Weertman A, Salet S. Interpretation bias in Cluster-C and borderline personality disorders. Behav Res Ther 2011;49(8):472–481.

Beck JG, Coffey SF, Foy DW, et al. Group cognitive behavior therapy for chronic posttraumatic stress disorder: An initial randomized pilot study. Behav Ther 2009;40:82–92.

Bisson JI, Shepherd JP, Joy D, et al. Early cognitive-behavioural therapy for post-traumatic stress symptoms after physical injury. Br J Psychiatry 2004;184:63-69.

Bormann JE, Thorp SR, Wetherell JL, et al. Meditation-Based Mantram Intervention for Veterans With Posttraumatic Stress Disorder: A Randomized Trial. Psychol Trauma 2012, March. Advance online publication. doi: 10.1037/a0027522.

Botella C, Garcia-Palacios A, Villa H, et al. Virtual reality exposure in the treatment of panic disorder and agoraphobia: a controlled study. Clin Psychol Psychother 2007;14:164–175.

Chard KM. An evaluation of cognitive processing therapy for the treatment of posttraumatic stress disorder related to childhood sexual abuse. J Consult Clin Psychol 2005;73(5):965–971.

Chard KM, Schumm JA, McIlvain SM, et al. Exploring the efficacy of a residential treatment for veterans with PTSD and traumatic brain injury. J Trauma Stress 2011;24(3):347–351.

Chard KM, Schumm JA, Owens GP, et al. A comparison of OEF and OIF veterans and Vietnam veterans receiving cognitive processing therapy. J Trauma Stress 2010;23(1):25–32.

De Jonghe F, Hendriksen M, van Aalst G, et al. Psychotherapy alone and combined with pharmacotherapy in the treatment of depression. Br J Psychiatry 2004;185:37-45.

Dickhaut V, Arntz A. Combined group and individual schema therapy for borderline personality disorder: A pilot study. J Behav Ther Exp Psychiatr 2014;45:242-251.

Dimidjian S, Hollon SD, Dobson KS, et al. Randomized trial of behavioral activation, cognitive therapy, and antidepressant medication in the acute treatment of adults with major depression. J Consult Clin Psychol 2006;74:658–670.

DuHamel KN, Mosher CE, Winkel G, et al. Randomized clinical trial of Telefone – administered cognitive-behavioral therapy to reduce posttraumatic stress disorder and distress symptoms after hematopoietic stem-cell transplantation. J Clin Oncol 2010;28(23):3754-3761.

Ekers D, Richards D, Gilbody S. A meta-analysis of behavioural therapy for depression. Psychol Med 2008;38(5):611-623.

Fava GA, Rafanelli C, Grandi S, et al. Six-year outcome for cognitive behavioral treatment of residual symptoms in major depression. Am J Psychiatry 1998;155:1443–1445.

Fava GA, Ruini C, Rafanelli C, et al. Six-year outcome of cognitive behavior therapy for prevention of recurrent depression. Am J Psychiatry 2004;161:1872–1876.

Fiorillo A, Malangone C, Del Vecchio VC, et al. Maj The effect of family psychoeducational interventions on patients with depression. Eur Psychiatry 2011;26:7.

Foa EB, Dancu CV, Hembree EA, et al. A Comparison of exposure therapy, stress inoculation training, and their combination for reducing posttraumatic stress disorder in female assault victims. J Consult Clin Psychol 1999;67(2):194-200.

Foa EB, Hembree EA, Cahill SP, et al. Randomized trial of prolonged exposure for posttraumatic stress disorder with and without cognitive restructuring: outcome at academic and community clinics. J Consult Clin Psychol 2005;73(5):953-964.

Foa EB, Rothbaum BO, Riggs DS, et al. Treatment of posttraumatic stress disorder in rape victims : A comparison between cognitive-behavioral procedures and counseling. J Consult Clin Psychol 1991;59(5):715-723.

Friedman MJ, Marmar CR, Baker DG, et al. Randornized, double-blind comparison of sertraline and placebo for posttraumatic stress disorder in a Departrnent ofVeterans Affairs setting. J Clin Psychiatry 2007;68(5):711- 720.

Furmark T, Carlbring P, Hedman E, et al. Guided and unguided self-help for social anxiety disorder: randomized controlled trial. Br J Psychiatry 2009;195(5):440-447.

Garcia-Palacios A, Hoffman H, Carlin A, et al. Virtual reality in the treatment of spider phobia: a controlled study. Behav Res Ther 2002;40:983–993.

Giesen-Bloo J, van Dyck R, Spinhoven P, et al. Outpatient psychotherapy for borderline personality disorder randomized trial of schema-focused therapy vs. transference-focused psychotherapy. Arch Gen Psychiatry 2006;63(6):649–658.

Gilboa-Schechtman E, Foa EB, Shafran N, et al. Prolonged exposure vs dynamic therapy for adolescent PTSD: A pilot randomized controlled trial. J Am Acad Child Adolesc Psychiatry 2010;49(10):1034-1042.

Gray MJ, Schorr Y, Nash W, et al. Adaptive disclosure: An open trial of a novel exposure-based intervention for service members with combat-related psychological stress injuries. Behav Ther 2012;43:407–415.

Hellstrom K, Öst LG. One-session therapist directed exposure vs. 2 forms of manual directed self-exposure in the treatment of spider phobia. Behav Res Ther 1995;33:959–965.

Huband N, McMurran M, Evans C, et al. Social problem-solving plus psychoeducation for adults with personality disorder : pragmatic randomised controlled trial. Br J Psychiatry 2007;190:307-313.

Joling KJ, van Hout HP, van't Veer-Tazelaar PJ, et al. How effective is bibliotherapy for very old adults with subthreshold depression? A randomized controlled trial. Am J Geriatr Psychiatry 2011;19(3):256-265.

Katon WJ, Von Korff M, Lin EH, et al. The Pathways Study: a randomized trial of collaborative care in patients with diabetes and depression. Arch Gen Psychiatry 2004;61:1042–1049.

Lee CW, Gavriel H, Drummond PD, et al. Treatment of PTSD: stress inoculation training with prolonged exposure compared to EMDR. J Clin Psychol 2002;58(9):1071–1089.

Li M, Chen K, Mo Z. Use of qigong therapy in the detoxification of heroin addicts. Altern Ther Health Med 2002;8:50–59.

Lobbestael J, Arntz A, Cima M, et al. Effects of induced anger in patients with antisocial personality disorder. Psychol Med 2009;39(4):557–568.

Lobbestael J, Arntz A. Emotional, cognitive and physiological correlates of abuse-related stress in borderline and antisocial personality disorder. Behav Res Ther 2010;48(2):116–124.

Lobbestael J, Arntz A, Sieswerda S. Schema modes and childhood abuse in borderline and antisocial patients. J Behav Ther Exp Psychiatry 2005;36(3):240–253.

Lobbestael J, Arntz A. The state dependency of cognitive schemas in antisocial patients. Psychiatry Res 2012;198:452-456.

Markowitz JC, Kocsis JH, Bleiberg KL, et al. A comparative trial of psychotherapy and pharmacotherapy for "pure" dysthymic patients. J Affect Dis 2005;89:167–175.

Markowitz JC, Kocsis JH, Christos P, et al. Pilot study of interpersonal psychotherapy for dysthymic patients with secondary alcohol abuse or dependence. J Nerv Ment Dis 2008;196:468–474.

Markowitz JC, Kocsis JH, Fishman B, et al. Treatment of depressive symptoms in human immunodeficiency virus-positive patients. Arch Gen Psychiatry 1998;55:452–457.

McDonagh A, Friedman M, McHugo G, et al. Randomized trial of cognitivebehavioral
therapy for chronic posttraumatic stress disorder in adult female survivors of childhood sexual abuse. J Consult Clin Psycho 2005;73(3):515-524.

Monson CM, Schnurr PP, Resick PA, et al. Cognitive processing therapy for veterans with military-related posttraumatic stress disorder. J Consult Clin Psychol 2006;74(5):898–907.

Nacasch N, Foa EB, Huppert JD, et al. The efficacy of prolonged exposure therapy for combat and terror-related PTSD: A randomized control comparison with treatment as usual. Am J Psychiatry 2011;72(9):1174-1180.

Nadort M, Arntz A, Smit JH, et al. Implementation of outpatient schema therapy for borderline personality disorder with versus without crisis support of the therapist outside office hours: A randomized trial. Behav Res Ther 2009;47:961–973.

Nadort M, van Dyck R, Smit JA, et al. Three preparatory studies for promoting implementation of outpatient schema therapy for borderline personality disorder in general mental health care. Behav Res Ther 2009;47(11):938–945.

Neylan TC, Lenoci M, Maglione ML, et al. The effect of nefazodone on subjective and objective sleep quality in posttraumatic stress disorder. J Clin Psychiatry 2003;64(4):445–450.

Neylan TC, Lenoci M, Samuelson KW, et al. No improvement of post-traumatic stress disorder symptoms with guanfacine treat-ment. Am J Psychiatry 2006;163(12):2186–2188.

Nordin S, Carlbring P, Cuijpers P, et al. Expanding the limits of bibliotherapy for panic disorder: Randomized trial of self-help without support but with a clear deadline. Behav Ther 2010;41(3):267-276.

Öst LG, Salkovskis PM, Hellstrom K. One-session therapist-directed exposure vs. Self-exposure in the treatment of spider phobia. Behav Ther 1991;22:407-422.

Palic S, Elkit A. An explorative outcome study of CBT-based multidisciplinary treatment in a diverse group of refugees from a Danish treatment centre for rehabilitation of traumatized refugees. Torture 2009;19(3):248-270.

Perlis RH, Nierenberg AA, Alpert JE, et al. Effects of adding cognitive therapy to fluoxetine dose increase on risk of relapse and residual symptoms in continuation treatment of major depressive disorder. J Clin Psychopharmacol 2002;22:474–480.

Reiss N, Lieb K, Arntz A, et al. Responding to the treatment challenge of patients with severe BPD: results of three pilot studies of inpatient schema therapy. Behav Cog Psychother 2014;42:355-367.

Resick PA, Galovski TE, O'Brien Uhlmansiek M, et al. A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interper-sonal violence. J Consult Clin Psychol 2008;76(2):243–258.

Resick PA, Nishith P, Weaver TL, et al. A comparison of cognitive-processing therapy with pro-longed exposure and a waiting condition for the treatment of chronic posttraumatic stress disorder in female rape vic-tims. J Consult Clin Psychol 2002;70(4):867–879.

Schindler A, Hiller W. Therapieeffekte und Responseraten bei unipolar deperssiven Patienten einer verhaltenstherapeutischen Hochschulambulanz [Therapy effects and response rates of cognitive-bahavioral treatment for unipolar depressive patients in an outpatient clinic] Zeitschrift für Klinische Psychologie und Psychotherapie: Forschung und Praxis 2010;39:107-115.

Schnurr PP, Friedman MJ, Engel CC, et al. Cognitive behavioral therapy for posttraumatic stress disorder in women: a randomized controlled trial. JAMA 2007;297(8):820-830.

Schnurr PP, Friedman MJ, Foy DW, et al. Randomized trial of traumafocused group therapy for posttraumatic stress disorder: results li•om a department of veterans affairs eooperative study. Arch Gen Psychiatry 2003;60(5):481-489.

Schnurr PP, Friedman MJ, Lavori PW, et al. Design of Department of Veterans Affairs Cooperative Study No. 420: Group treatment of posttraumatic stress disorder. Control Clin Trials 2001;22(1):74–88.

Shelton RC, Haman KL, Rapaport MH, et al. A randomized, double-blind, active-control study of sertraline versus venlafaxine XR in major depressive disorder. J Clin Psychiatry 2006;67:1674–1681.

Sieswerda S, Arntz A, Kindt M. Successful psychotherapy reduces hypervigilance in borderline personality disorder. Behav Cog Psychotherapy 2007;35(4):387–402.

Sieswerda S, Arntz A, Mertens I, et al. Hypervigilance in patients with borderline personality disorder: Specificity, automaticity, and predictors. Behav Res Ther 2007;45(5):1011–1024.

Spinhoven P, Giesen-Bloo J, van Dyck R, et al. Can assessors and therapists predict the outcome of long-term psychotherapy in borderline personality disorder? J Clin Psychol 2008;64(6):667–686.

Spinhoven P, Giesen-Bloo J, van Dyck R, et al. The therapeutic alliance in schema-focused therapy and transference-focused psychotherapy for borderline personality disorder. J Consult Clin Psychol 2007;75(1):104–115.

Swanson LM, Favorite TK, Horin E, et al. A combined group treatment for nightmares and insomnia in combat veterans: A pilot study. J Trauma Stress 2009;22(6):639–642.

Taylor DT, Meader N, Bird V, et al. Pharmacology subgroup of the National Institute for Health and Clinical Excellence Guideline Development Group for Depression in Chronic Physical Health Problems. Pharmacological interventions for people with depression and chronic physical health problems: Systematic review and meta-analyses of safety and efficacy. Br J Psychiatry 2011;198:179–188.

Van Asselt ADI, Dirksen CD, Arntz A, et al. Outpatient psychotherapy for borderline personality disorder: Cost effectiveness of schema-focused therapy versus transference focused psychotherapy. Br J Psychiatry 2008;192:450–457.

Van der Heiden C, Muris P, van der Molen HT. Randomized comrolled rrial on the cffectiveness of meracognirive therapy and inrolerance-of-uncerrainry rherapy for generalized anxiery disorder. Bebav Res Ther 2012;50(2):100-109.

Van Emmerik AAP, Kamphuis JH, Ernmelkamp PMG. Treating acute stress disorder and posttraumatic stress disorder with cognitive behavioral therapy or structured writing therapy: a randomized controlled trial. Psychother Psychosom 2008;77:93-100.

Vilhauer JS, Young S, Kealoha C, et al. Treating major depression by creating positive expectations for the future: a pilot study for the effectiveness of future directed therapy (FDT) on symptom severity and quality of life. CNS Neurosci Ther 2012;18(2):102-109.

Watts BV, Landon B, Groft A, et al. A sharn controlled study of repetitive transcranial magnetic stimulation for posttraumatic stress disorder. Brain Stimul 2012;5(1):38-43.

Willemse GRWM, Smit F, Cuijpers P, et al. Minimal-contact psychotherapy for sub-threshold depression in primary care. Br J Psychiatry 2004;185: 416-421.

Williams Jr JW, Katon W, Lin EH, et al. The effectiveness of depression care management on diabetesrelated outcomes in older patients. Ann Intern Med 2004;140:1015–1024.

Lieb et al., BMJ Open submission Checklist of items to include when reporting a systematic review or meta-analysis

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	n.a.
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	5
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Suppl Tables 1 and 2

Section/topic	#	Checklist item	Reported on page #
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	5 and Fig. 1
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	n.a.
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	7
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	n.a.
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	n.a.
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	n.a.
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	n.a.
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Fig. 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	n.a.
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome-level assessment (see Item 12).	n.a.
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group and (b) effect estimates and	n.a.

Section/topic	#	Checklist item	Reported on page #
		confidence intervals, ideally with a forest plot.	
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	n.a.
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	9
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression) (see Item 16).	n.a.
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., health care providers, users, and policy makers).	10f.
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review level (e.g., incomplete retrieval of identified research, reporting bias).	12
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	13
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	13

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Conflicts of interest and spin in reviews of psychological therapies: A systematic review

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Conflicts of interest and spin in reviews of psychological therapies: A systematic review

Revision to BMJ Open

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Abstract

Objective To explore conflicts of interest (COI) and their reporting in systematic reviews of psychological therapies and to evaluate spin in the conclusions of the reviews.

Methods MEDLINE and PsycINFO databases were searched for systematic reviews published between 2010 and 2013 that assessed effects of psychological therapies for anxiety, depressive or personality disorders and included at least one randomized controlled trial (RCT). Required COI disclosure by journal, disclosed COI by review authors and the inclusion of own primary studies by review authors were extracted. Researcher allegiance, i.e. that researchers concluded favourably about the interventions they have studied, as well as spin, i.e. differences between results and conclusions of the reviews, were rated by two independent raters.

Results 936 references were retrieved, 95 reviews fulfilled eligibility criteria. 59 compared psychological therapies with other forms of psychological therapies, and 36 psychological therapies with pharmacological interventions. Financial, non-financial, and personal COI were disclosed in 22, 4, and 1 review, respectively. Two of 86 own primary studies of review authors included in 34 reviews were disclosed by review authors. In 15 of the reviews, authors showed an allegiance effect to the evaluated psychological therapy that was never disclosed. Spin in review conclusions was found in 27 of 95 reviews. Reviews with a conclusion in favour of psychological therapies (vs. pharmacological interventions) were at high risk for a spin in conclusions (OR = 8.31 [1.41 to 49.05]). Spin was related in trend to the inclusion of own primary studies in the systematic review (OR = 2.08 [CI 0.83 to 5.18] p = .11) and researcher allegiance (OR = 2.63 [0.84 to 8.16] p= 0.16).

Conclusions Non-financial COI, especially the inclusion of own primary studies into reviews and researcher allegiance, are frequently seen in systematic reviews of psychological therapies and need more transparency and better management.

Article summary

Strengths and limitations of this study

- This study addresses a widely neglected research topic, i.e. spin introduced by non-financial conflicts of interest, e.g. the researcher allegiance to a specific therapy, in reviews on psychotherapy studies.
- Although authors of reviews of psychological therapies frequently show COI (which mainly are not declared), the relationship to spin in review conclusions is less clear and has to be interpreted with caution.
- We decided to use the term “spin” instead of “bias”, although we cannot make claims about the nature of the influence which might be mere bias or more intentional spin.
- The selection of studies up to 2013 does not reflect possible changes in COI declarations in recent years. However, the authors are not aware of changes in COI declaration requirements regarding non-financial COI in 2014 or 2015.

Introduction

Conflicts of interest (COI) are defined as a set of circumstances that creates a risk that a professional judgement or action regarding a primary interest will be unduly influenced by a secondary interest[1 2]. Research on COI has so far mainly focused on financial COI such as close financial relationships between researchers or medical doctors and pharmaceutical companies or the financing of drug trials by pharmaceutical companies[3-7]. Such research has shown that studies funded by pharmaceutical companies more often yield results or conclusions in favour of the sponsoring company as compared to non-industry-funded trials [8 9], that close relationships of researchers to pharmaceutical companies are linked to biased assessments of drug safety and efficacy[10 11], that positive trials are more likely to be published than trials unfavourable to sponsors[12], and that COI are underreported in meta-analyses of pharmacological treatments[13 14].

The influence of non-financial COI, however, on the framing of research questions, the data analysis and interpretation of results, or the decision which results are being published, has been much less extensively studied[15]. With respect to outcome research of psychological therapies, researcher allegiance constitutes an important non-financial COI. Allegiance covers the belief of a researcher in the superiority of a treatment[16 17]. Allegiance may be due to a special training in one specific psychological therapy, the involvement in previous efficacy research about this psychological therapy or the involvement in development of etiological models via basic research.[18-20] Empirical studies showed a strong impact of researcher allegiance on outcome in psychotherapy studies: A recent meta-meta-analysis showed a robust and moderate allegiance outcome association (r = .26)[21], and such an association is also present in equally effective treatments[22]. Taking allegiance into account for the explanation of effect differences between two active treatments studies with balanced allegiance for two different treatments show no difference in the effectiveness[23].

Since nothing is known about the extent and nature of non-financial COI in systematic reviews of psychological therapies, the aim of this study was to investigate how often non-financial COI are present and disclosed in systematic reviews of psychological therapies and to analyze whether these COI increase the risk of spin in the conclusions of the reviews.

Methods

Search strategy and eligibility criteria of systematic reviews

We searched the MEDLINE and PsycINFO databases for systematic reviews or meta-analyses of randomised controlled trials (RCT) on psychological therapies. Reviews were selected if they fulfilled the following inclusion criteria: 1) Inclusion of psychological therapies to treat patients with anxiety disorders, personality disorders and/or major depressive disorders in adults, 2) Active control groups with either other forms of psychological therapy or pharmacological interventions, 3) Inclusion of at least one randomised study, 4) English language. Searches were last run on February 3rd 2014, covering the publication period of January 2010 to December 2013. For exact MEDLINE and PsycINFO search strategies, confer supplement tables 1 and 2.

Screening and inclusion of systematic reviews and primary studies

Retrieved references were initially screened for inclusion by title and abstract by two independent researchers. In a second step, full texts of relevant reviews were retrieved and assessed for inclusion by two independent researchers. These reviews were used to rate conflicts of interest and their disclosure (see below).

Primary studies included in these reviews were identified from the reference list of the systematic reviews and retrieved if one of the co-authors of the review was an author of the respective primary study. These primary studies were then used to rate researcher allegiance (see below).

Assessment of disclosed and undisclosed COI

All disclosed COI were extracted: financial COI (honoraria e.g. for consulting, lectures, scientific articles, training courses or money for research projects), non-financial COI (e.g. researcher allegiance to a psychological therapy, special qualification in a psychological therapy,

enthusiasm for a psychological therapy in scientific publications, lectures and research, or inclusion of own primary studies in reviews), and personal COI (e.g. employee or private relationship to an employee of a company - regularly addressed as relationships to pharmaceutical companies). If no COI was reported, the websites of the respective journals as well as the guidelines for authors were screened for requirements of COI disclosures at the time of the publication of the review. In addition, we assessed whether review authors included own studies on psychological therapies into their review and whether this inclusion was disclosed.

Rating of researcher allegiance

In case that a review author included at least one own primary study (which he or she co-authored) into the review, we retrieved these primary studies and rated the researcher allegiance according to information presented in the primary study (note that a rating of researcher allegiance was not possible in the reviews since these do not provide essential information to rate researcher allegiance according to established standards.[18-20]). Researcher allegiance was rated in 73 of the 86 included primary studies since 13 reviews did not compare psychological therapies to other treatments and were therefore excluded.

Researcher allegiance was defined to be present, if the author a) recommended the respective psychological therapy over another therapy and was b) either involved in the development of the respective psychological therapy or c) was involved in research of/development of the etiological model of the psychological therapy. Two independent researchers (JOS, JB) assessed allegiance in the primary studies and disagreements were resolved with a third rater (KL). If researcher allegiance was rated to be present in at least one of the primary studies included in a review, this review was rated as afflicted by researcher allegiance. Kappa statistics showed substantial inter-rater reliability (k = 0.62; agreement 82%).

Assessment of spin in review conclusions

To assess spin in review conclusions, we evaluated whether the conclusion of the review as expressed in the abstract or the discussion section was inconsistent or consistent to the

empirical results described in the results section of the review. If the conclusion was consistent with the empirical results, the review was considered as showing no spin. If it was inconsistent, the review was rated as showing spin. Two researchers (KL, JOS), who both were blind to the author names of the review as well as the Journal having published the review, independently assessed review conclusions and results and rated whether a spin in review conclusions was present or not. If no consensus was achieved, disagreements were resolved by a third person (JB). Kappa statistics showed substantial inter-rater reliability (k = 0.70; agreement 87%).

Statistical analyses

The percentage of disclosed COI, researcher allegiance and reviews with spin was calculated. For the first two indicators, the number of reviews was the denominator, the latter indicator was calculated with the number of studies as denominator. The association of researcher allegiance with a spin in the conclusion of reviews is presented as Odds ratio with 95% confidence interval. The same procedure was used for the association of the inclusion of own primary studies of the authors in the review and the disclosure of COI with a spin in the review.

Results

Our search yielded 936 references. After screening and retrieving full text articles, 95 reviews remained which met our inclusion criteria. A detailed flow chart with a schedule of the reasons for exclusions is found in figure 1. The reviews and meta-analyses addressed anxiety disorders (n = 42), depressive disorders (n = 48), and/or personality disorders (n = 13) and allowed conclusions about the following interventions: 59 reviews compared psychological therapies with other forms of psychological therapies, and 36 compared psychological therapies with pharmacological interventions.

- Insert figure 1 about here -

Required COI disclosure by journal and disclosed COI

The references of the 95 reviews included in this study are listed in Supplement table 3. Supplement table 4 gives an overview how many reviews were published per year in which journal. 40 of the 50 journals regularly requested a disclosure of COI at the time of publication of the respective review. Supplement table 5 demonstrates which journal asked for which kind of COI disclosure in the respective year of publication of the review article. In sum: Of the 50 publishing journals, 40 requested a disclosure of financial COI (80%), 28 of personal COI (56%), and 17 of non-financial COI (34%).

In 37 of 95 reviews (38.9%), the authors disclosed that no competing interests exist. Authors in 25 of 95 reviews (26.3%) made COI statements as follows: Own study included in the review (n = 2), research activities in relation to one psychological therapy (n = 2), research support (n = 18), author has served as consultant (n = 4), served as speaker on congresses (n = 1), get honoraria (n = 5), have holdings (n = 2), have patents (n = 1), served as a trainer for a psychological therapy (n = 1), being influenced as employer (n = 1). In other words, financial, non-financial, and personal COI were disclosed in 22 reviews (23.1%), 4 reviews (4.2%), and 1 review (1%), respectively. One of the disclosures of financial COI was given in a Journal which does not request declaration of COI; the non-financial and personal COI were all given in Journals requesting such disclosures. In 33 of 95 reviews (34.7%) no COI statement was made.

Inclusion of own studies into the reviews and researcher allegiance

We also looked at the frequency of the inclusion of own primary studies into the review and the allegiance of the researcher. 34 of 95 reviews (35.8%) included at least one primary study of one of the review authors. In sum, 86 primary studies (all addressing psychological therapies) were identified which were included in 34 reviews (see Supplement table 6 for references of these included studies). 20 reviews included 1 study, 4 reviews 6 studies, 4 reviews 3 studies, 4 reviews 2 studies, 1 review 4 studies and 1 review 18 studies. In 15 of the 34 reviews which included at least one own primary study, we found a researcher allegiance.

Since both the inclusion of own primary studies and researcher allegiance can be described as non-financial COI, we further assessed the disclosure of such COI in relation to the requests of the journal to declare non-financial COI. Regarding the inclusion of own studies into the review, we found: Of 34 reviews including own primary studies, inclusion of own studies by review authors was declared in 2 reviews according to the policy of the journal which specifically asked for inclusion of own studies, was not declared in 16 reviews published in journals requesting the disclosure of non-financial COI (but not defining inclusion of own studies as non-financial COI specifically), and was not declared in 16 reviews published in journals not requesting the disclosure of non-financial COI at all. Regarding researcher allegiance, we found that researcher allegiance was never disclosed: Of 15 reviews with a researcher allegiance, researcher allegiance was not declared in 9 reviews published in journals requesting the disclosure of non-financial COI (but not defining researcher allegiance as non-financial COI specifically), and was not declared in 6 reviews published in journals not requesting the disclosure of non-financial COI at all.

Spin in review conclusions

Spin in the interpretation of review results was rated to be present in 27 of 95 reviews (28%). Within the 36 reviews comparing psychological therapies to pharmacological interventions, 9 (25%) showed a spin. In reviews comparing psychological therapies and pharmacological interventions, spin in favour of a specific psychological therapy was more often present as compared to spin in favour of a pharmacological intervention (figure 2). Reviews with a favourable conclusion about psychological therapies (vs. pharmacological interventions) are at high risk for a spin in conclusions (OR = 8.31 [1.41 to 49.05]), whereas favourable conclusions about effects of pharmacological interventions showed no spin in our sample (OR = 1.00 [0.16 to 6.14]. Also the conclusion of equal effects of psychological therapies and pharmacological interventions does not face a risk of spin (OR = 0.12 [0.01 to 1.08]. The conclusion of the equality of effects of psychological therapies, however, showed a trend for a spin, which means

that for the primary outcome of interest the review more often states equality despite inequality of treatment effects (OR = 2.69 [0.86 to8.41].

- Insert figure 2 about here -

We further explored whether spin in review conclusions is associated with a disclosed COI, the inclusion of own primary studies of the authors or the researcher allegiance of the authors. To do so, we first investigated these associations in all 95 reviews (table 1). Conclusions with spin were not associated to disclosed COI. However, spin in conclusions was associated in trend to the inclusion of own studies in the systematic review. Reviews with inclusion of own primary studies showed more often spin than reviews without inclusion of own primary studies of the review authors (OR = 2.08 [CI 0.83 to 5.18] p = .11; table 1). The odds for spin in conclusions in systematic reviews including studies with researcher allegiance was similarly increased, but statistically non-significant (OR=2.63[0.84 to 8.12], p = .16; table 1).

- Insert table 1 about here -

Since we were especially interested in spin in favour of psychological therapies, we also investigated whether spin in review conclusions in favour of psychological therapies is associated with a disclosed COI, the inclusion of own primary studies of the authors or the researcher allegiance of the authors (table 2). However, none of the associations were statistically significant or showed trends.

- Insert table 2 about here -

Discussion

This study is – at least to our knowledge - the first that systematically assessed the extent and nature of reporting of financial and non-financial COI in systematic reviews of psychological

therapies and that investigated how often these conflicts are disclosed and whether they may lead to spin in review conclusions. Financial and non-financial COI were disclosed only in 23.1% and 4.2% of the reviews, respectively, although non-financial COI were much more often detectable: Review authors had included 86 own studies in approximately 1/3rd of the reviews and authors of at least 16% of the reviews had allegiance for the evaluated psychological therapy. Spin in review conclusions was found in 27 of 95 reviews (28%) and was associated in trend to a non-financial COI, i.e. the inclusion of own primary studies in the systematic review.

Disclosure of financial, non-financial and personal COI

The disclosure of financial COI was requested by 80% of the journals which published the reviews in our study, but only 22 reviews (23.2%) disclosed any financial COI. This may be explained by two reasons: Firstly, systematic reviews focussing on effectiveness of psychological therapies are most often written by psychologists who have rather seldom financial ties to pharmaceutical companies as compared to physicians who often show these relationships[3-7], and secondly, the minority of reviews (36 of 95 reviews) compared psychological therapies to pharmacological interventions (in 10 of those reviews, financial COI were disclosed). Although psychologists may mostly judge themselves as free of financial COI, however, researcher allegiance as well as the inclusion of own studies into a review (which we both rated as non-financial COI) may well lead to financial gains indirectly.[15] Since psychologists who develop new psychological treatments are often the ones who distribute and train other psychologists in those therapies, the demonstration of effectiveness of a specific psychotherapy in a review may potentially lead to high financial incentives. The promotion of the respective therapy might be easier and the number of trained psychotherapists with high course fee increases. Showing the effectiveness of a treatment can be also an important step for patents and for the implementation in treatment guidelines. The fact that researchers developing and evaluating the effectiveness of psychological therapies are mostly allied to a specific psychotherapy (e.g. cognitive behavioural therapy or psychoanalysis), makes the issue of COI in psychology therapy research very complex and much more complicated than in pharmacological

research. Psychotherapy researchers who realize that the effect of the therapy to which they are allied is less beneficial than another therapy cannot easily switch their research program to another therapy (since they have often been trained in that therapy for many years) – in contrast to a researcher addressing pharmacotherapy who can more easily change his or her research agenda to another drug if a drug proves to be less effective than previously thought. Therefore, researcher allegiance might be present in primary studies in any case to some extent, but needs to be carefully declared in systematic reviews.

Non-financial COI were disclosed only in a very small number of reviews (4.2%) although non-financial COI such as the inclusion of own primary studies of the review authors (in 34 of 95 reviews) and researcher allegiance (in 15 of 95 reviews) were detectable in a considerable number of them. This low disclosure rate may be explained by three factors: Firstly, only a minority of journals (34% at the time of assessment) requests a disclosure of non-financial COI – and all 4 declarations of non-financial COI were done in these journals; secondly, only two journals (Perm J, Cochrane Database Syst Rev) specifically asked the authors for the inclusion of own primary studies and only two others (Psychol Trauma, J Psychiatr Res) asked for circumstances related to the presence of researcher allegiance at the point of our assessment; thirdly, researchers may not see the necessity to declare such COI although present and requested by the journal asking for non-financial COI. We conclude from this finding that the necessity to declare non-financial COI should be made more transparent in journal articles. The following strategies may be effective: Journals should consequently ask their authors to disclose any non-financial COI, should exactly define such conflicts and should include examples of common causes of non-financial COI such as the inclusion of own primary studies into review articles or researcher allegiance. Even the International Committee of Medical Journal Editors (ICMJE) mainly focuses on financial COI and their disclosure but gives little emphasis on and advice to the disclosure of non-financial COI.

Similar to non-financial COI, also personal COI were very seldom disclosed (only in one review). This is probably due to the common definition of personal COI meaning any relationship to a person working in a pharmaceutical company. This of course is a less relevant COI for

psychotherapist assessing treatment effects of psychological therapies. However, psychotherapists, especially the ones who develop new therapies, are very often personally involved in institutes promoting the distribution and training of new psychological therapies. Such personal COI may indirectly lead to considerable financial gains.

Spin in review conclusions

Previous research of our group and others has identified different risks increasing the likelihood of bias in psychotherapeutic outcome research.[21 24] In our study, we investigated whether researcher allegiance, an important risk factor of moderate effect size[21], the inclusion of own primary studies into the review or any declared COI may be associated to spin in review conclusions, which we found in 27 of the 95 reviews. Both reviews with inclusion of own primary studies and reviews with researcher allegiance showed more often a spin (statistical trend). Since researcher allegiance has been shown to be significantly related to outcome of psychological therapies[21], authors should be transparent in disclosing their own psychotherapeutic training background and the inclusion of own outcome studies in systematic reviews to make an assessment of COI and allegiance easier. The allegiance indicators of our study might be an initial step for such a statement (development of treatment or basic research on the etiological model for a specific treatment).

Shortcomings

This study has several shortcomings. Firstly, we restricted our search to systematic reviews and meta-analyses of anxiety disorders, personality disorders and major depressive disorders. This may limit the generalizability of our findings. Secondly, our study is limited to published reports from 2010 onwards. This limits generalizability to earlier reviews, but is justified since COI reporting has become more regular nowadays and authors might not have been asked for a COI statement in earlier submissions. Thirdly, our indicators of COI and allegiance are based on

publications and reporting quality on some indicators was rather low. The inter-rater reliability of both ratings might be much better if reporting standards in journals would be implemented. Fourth, we only checked the disclosed COI, but did not investigate whether authors might have more COI than the disclosed ones. We also did not investigate which authors of a review might be responsible for the evaluation and interpretation of studies addressing different types of interventions (i.e. pharmacotherapy and psychotherapy), since such investigations are at high risk of being inaccurate and incomplete.

Conclusions and suggestions for the management of COI in psychotherapy outcome research

We conclude that non-financial COI, especially the inclusion of own primary studies into reviews and researcher allegiance, are frequently seen in systematic reviews of psychological therapies and need more transparency. Most policies and Journal requirements for COI disclosure focus on the importance of financial COI for risks of bias and fail to capture the risk of spin associated with an allegiance. Therefore, if Journals place more emphasis on the declaration of non-financial COI, declaration rates of non-financial COI by authors will most likely increase. If spin effects of non-financial COI in psychotherapy outcome research are confirmed in further studies, journals should do more than simply providing transparency of COI in order to better manage the impact of COI on research outcomes and publications [15]. Strategies to mitigate biases may include the detection and removal of spin at the editorial stage, using independent authors and reviewers interpreting the findings of meta-analyses, the rejection of systematic reviews that demonstrate selective citation biases, and providing free access to all data of systematic reviews to ensure that systematic reviews can be more easily replicated.

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Contributorship statement

KL designed the study, analysed data, monitored study extraction, data analysis and interpretation, and drafted and revised the paper. He is guarantor. JOS and NR extracted and analysed data and revised the draft of the manuscript, JSW analysed data and revised the draft of the manuscript. JB analysed data, monitored study extraction, data analysis and interpretation, and revised the paper. All authors gave final approval of the version to be published. All authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Transparency declaration

The guarantor affirms that the manuscript is an honest, accurate, and transparent account of the study being reported and that no important aspects of the study have been omitted.

Declaration of competing interests

All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: no support from any organisation for the submitted work; KL and JB are active in research on conflicts of interest in medicine and psychology, and JB was involved in the development of indicators of allegiance. All authors declare that they had no financial or personal relationships with pharmaceutical companies within the last 3 years. KL, NR, JSW and JB are psychotherapists trained in CBT, KL and NR also in schematherapy. NR and JB, but not KL and JSW, did receive money from institutes providing training in schematherapy and CBT within the last three years. JSW and KL are coauthors on two reviews included into the study (Gibbon et al., 2010 and Stoffers et al., 2012), and NR and KL are coauthors on one primary study (Reiss et al., 2014) included in one of the reviews.

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Data sharing statement

Extra data is available by emailing Klaus.lieb@unimedizin-mainz.de.

References

1. Thompson DF. The Challenge of Conflict of Interest in Medicine. Z Evid Fortbild Qual Gesundhwes 2009;**103**(3):136-40.
2. Lo B, Fields (ed.) *Conflict of Interest in Medical Research, Education, and Practice*, Institute of Medicine 2009.
3. Campbell EG. Doctors and drug companies - scrutinizing influential relationships. N Engl J Med 2007;**357**(18):1796-7.
4. Campbell EG, Rao SR, DesRoches CM, et al. Physician professionalism and changes in physician-industry relationships from 2004 to 2009. Arch Intern Med 2010;**170**(20):1820-6.
5. Campbell EG, Weissman JS, Ehringhaus S, et al. Institutional academic industry relationships. JAMA 2007;**298**(15):1779-86.
6. Lieb K, Brandtönies S. A survey of german physicians in private practice about contacts with pharmaceutical sales representatives. Dt Arztebl Int 2010;**107**(22):392.
7. Lieb K, Scheurich A. Contact between Doctors and the Pharmaceutical Industry, Their Perceptions, and the Effects on Prescribing Habits. PloS one 2014;**9**(10):e110130.
8. Bekelman JE, Li Y, Gross CP. Scope and impact of financial conflicts of interest in biomedical research: a systematic review. JAMA 2003;**289**(4):454-65.
9. Schott G, Pachl H, Limbach U, et al. The financing of drug trials by pharmaceutical companies and its consequences. Part 1: a qualitative, systematic review of the literature on possible influences on the findings, protocols, and quality of drug trials. Dt Arztebl Int 2010;**107**(16):279-85.
10. Wang AT, McCoy CP, Murad MH, et al. Association between industry affiliation and position on cardiovascular risk with rosiglitazone: cross sectional systematic review. BMJ 2010;**340**:c1344.
11. Dunn AG, Arachi D, Hudgins J, et al. Financial conflicts of interest and conclusions about neuraminidase inhibitors for influenza: an analysis of systematic reviews. Ann Intern Med 2014;**161**(7):513-8.
12. Roest AM, de Jonge P, Williams CD, et al. Reporting Bias in Clinical Trials Investigating the Efficacy of Second-Generation Antidepressants in the Treatment of Anxiety Disorders: A Report of 2 Meta-analyses. JAMA psychiatry 2015;**72**(5):500-10.
13. Roseman M, Milette K, Bero LA, et al. Reporting of conflicts of interest in meta-analyses of trials of pharmacological treatments. JAMA 2011;**305**(10):1008-17.
14. Roseman M, Turner EH, Lexchin J, et al. Reporting of conflicts of interest from drug trials in Cochrane reviews: cross sectional study. BMJ 2012;**345**:e5155.
15. Clark AM, Choby A, Ainsworth K, et al. Addressing conflict of interest in non-pharmacological research. Int J Clin Pract. 2015;**69**(3):270-2.
16. Leykin Y, DeRubeis RJ. Allegiance in Psychotherapy Outcome Research: Separating Association From Bias. 2009.
17. Lambert MJ. Are differential treatment effects inflated by researcher therapy allegiance? Could Clever Hans count? Clinical Psychology: Science and Practice 1999;**6**(1):127-30.
18. Gaffan EA, Tsaousis I, Kemp-Wheeler SM. Researcher allegiance and meta-analysis: the case of cognitive therapy for depression. J Consult Clin Psychol. 1995;**63**(6):966-80.
19. Munder T, Gerger H, Trelle S, et al. Testing the allegiance bias hypothesis: a meta-analysis. Psychother Res 2011;**21**(6):670-84.
20. Miller S, Wampold B, Varhely K. Direct comparisons of treatment modalities for youth disorders: a meta-analysis. Psychother Res 2008;**18**(1):5-14.
21. Munder T, Brutsch O, Leonhart R, et al. Researcher allegiance in psychotherapy outcome research: an overview of reviews. Clin Psychol Rev 2013;**33**(4):501-11.

22. Munder T, Fluckiger C, Gerger H, et al. Is the allegiance effect an epiphenomenon of true efficacy differences between treatments? a meta-analysis. J Couns Psychol 2012;**59**(4):631-7.
23. Cuijpers P, Driessen E, Hollon SD, et al. The efficacy of non-directive supportive therapy for adult depression: a meta-analysis. Clin Psychol Rev 2012;**32**(4):280-91.
24. Cuijpers P, van Straten A, Bohlmeijer E, et al. The effects of psychotherapy for adult depression are overestimated: a meta-analysis of study quality and effect size. Psychol Med 2010;**40**(2):211-23.

Figure Legends:

Figure 1: Flow chart of study selection

Figure 2: Risk of spin in review conclusions in comparisons of different treatments

Tables

Table 1 Association between disclosed COI and other forms of COI (i.e. inclusion of primary studies in reviews, researcher allegiance) and spin in review conclusions in all 95 reviews.

	Review with spin in conclusion	Review without spin in conclusion	Odds Ratio [95% confidence interval]
Inclusion of own primary study	13	21	2.08 [0.83 to 5.18]
No inclusion of own primary study	14	47	
Researcher allegiance	7	8	2.63 [0.84 to 8.16]
No researcher allegiance	20	60	
COI disclosed	9	16	1.63 [0.61 to 4.32]
No COI disclosed	18	52	
Inclusion of own primary study, researcher allegiance and/or COI declared	16	31	1.74 [0.70 to 4.29]
None of the three	11	37	

Table 2: Association between disclosed COI and other forms of COI (i.e. inclusion of primary studies in reviews, researcher allegiance) and spin in review conclusions in the reviews rated as having spin in favour of psychological therapies as compared to all other reviews.

	Review rated as "spin" in favour of psychological therapies	Review rated as "no spin" or "spin" against psychological therapies	Odds Ratio [95% confidence interval]
Inclusion of own primary study	6	28	1.24 [0.40 to 3.83]
No inclusion of own primary study	9	52	
Researcher allegiance	2	13	0.79 [0.16 to 3.94]
No researcher allegiance	13	67	
COI disclosed	4	21	1.02 [0.29 to 3.56]
No COI disclosed	11	59	
Inclusion of own primary study, researcher allegiance and/or COI disclosed	7	40	0.88 [0.29 to 2.64]
None of the three	8	40	

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Figure 1: Flow chart of study selection

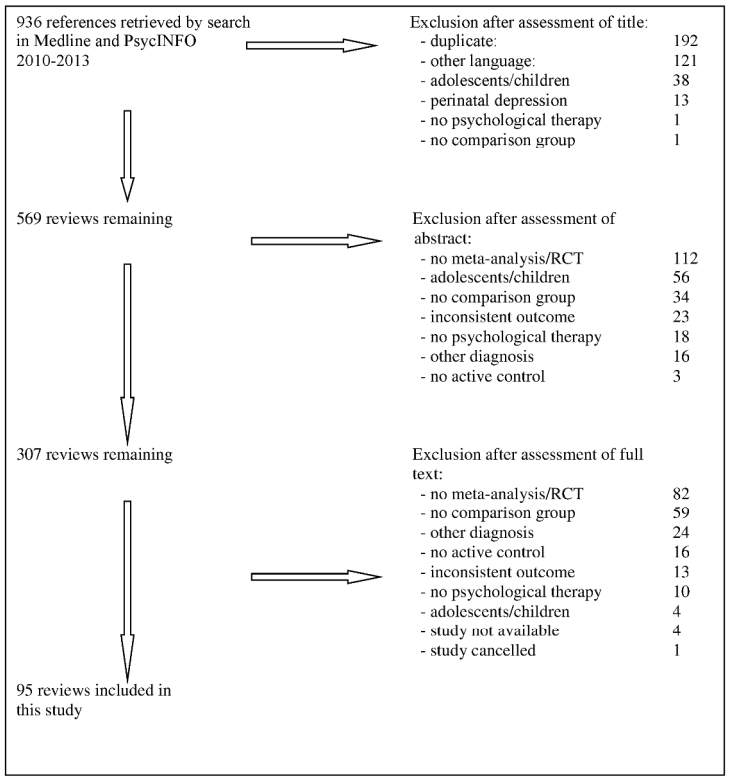

Fig. 1
210x297mm (300 x 300 DPI)

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Figure 2: Risk of spin in review conclusions in comparisons of different treatments (Tx1 vs. Tx2).

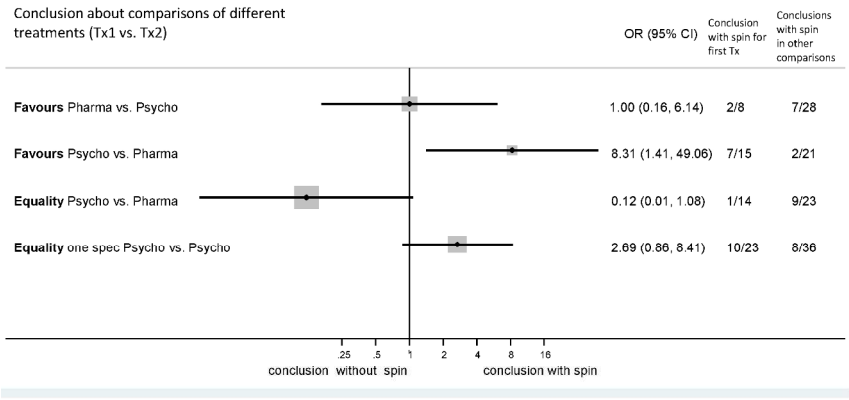

Fig. 2
210x297mm (300 x 300 DPI)

Supplements

Conflicts of interest and bias in systematic reviews of psychological therapies

Revision to BMJ Open

Klaus Lieb, Jan von der Osten-Sacken, Jutta Stoffers-Winterling, Neele Reiss, Jürgen Barth

Supplement Table 1: MEDLINE EBSCO exact search strategy (last run on February 3rd, 2014)

#	
S1	(MH “Psychotherapy+”)
S2	(MH “Anxiety Disorders+”)*
S3	(S1 AND S2)
S4	(S1 AND S2) – Date of publication: 20100101-20131231; Publication Type: Meta-Analysis, Review

* This search is exemplary for anxiety disorders. Separate searches were done for depressive and personality disorders, using controlled vocabulary (MH “Depressive Disorders+”) or (MH “Personality Disorders+”), resp.

Supplement Table 2: PsycINFO EBSCO exact search strategy (last run on February 3rd, 2014)

#	
S1	DE "Psychotherapy" OR DE "Adlerian Psychotherapy" OR DE "Adolescent Psychotherapy" OR DE "Analytical Psychotherapy" OR DE "Autogenic Training" OR DE "Behavior Therapy" OR DE "Brief Psychotherapy" OR DE "Brief Relational Therapy" OR DE "Child Psychotherapy" OR DE "Client Centered Therapy" OR DE "Cognitive Behavior Therapy" OR DE "Conversion Therapy" OR DE "Eclectic Psychotherapy" OR DE "Emotion Focused Therapy" OR DE "Existential Therapy" OR DE "Experiential Psychotherapy" OR DE "Expressive Psychotherapy" OR DE "Eye Movement Desensitization Therapy" OR DE "Feminist Therapy" OR DE "Geriatric Psychotherapy" OR DE "Gestalt Therapy" OR DE "Group Psychotherapy" OR DE "Guided Imagery" OR DE "Humanistic Psychotherapy" OR DE "Hypnotherapy" OR DE "Individual Psychotherapy" OR DE "Insight Therapy" OR DE "Integrative Psychotherapy" OR DE "Interpersonal Psychotherapy" OR DE "Logotherapy" OR DE "Narrative Therapy" OR DE "Network Therapy" OR DE "Persuasion Therapy" OR DE "Primal Therapy" OR DE "Psychoanalysis" OR DE "Psychodrama" OR DE "Psychodynamic Psychotherapy" OR DE "Psychotherapeutic Counseling" OR DE "Rational Emotive Behavior Therapy" OR DE "Reality Therapy" OR DE "Relationship Therapy" OR DE "Solution Focused Therapy" OR DE "Supportive Psychotherapy" OR DE "Transactional Analysis"
S2	DE "Anxiety Disorders" OR DE "Acute Stress Disorder" OR DE "Castration Anxiety" OR DE "Death Anxiety" OR DE "Generalized Anxiety Disorder" OR DE "Obsessive Compulsive Disorder" OR DE "Panic Disorder" OR DE "Phobias" OR DE "Posttraumatic Stress Disorder" OR DE "Separation Anxiety"
S3	(S1 AND S2)
S4	(S1 AND S2) – Published date: 20100101-20131231; Methodology: -Systematic Review, -Meta Analysis

* This search is exemplary for anxiety disorders. Separate searches were done for depressive and personality disorders, using controlled vocabulary (DE "Major Depression" OR DE "Anaclitic Depression" OR DE "Dysthymic Disorder" OR DE "Endogenous Depression" OR DE "Postpartum Depression" OR DE "Reactive Depression" OR DE "Recurrent Depression" OR DE "Treatment Resistant Depression") or (DE "Personality Disorders" OR DE "Antisocial Personality Disorder" OR DE "Avoidant Personality Disorder" OR DE "Borderline Personality Disorder" OR DE "Dependent Personality Disorder" OR DE "Histrionic Personality Disorder" OR DE "Narcissistic Personality Disorder" OR DE "Obsessive Compulsive Personality Disorder" OR DE "Paranoid Personality Disorder" OR DE "Passive Aggressive Personality Disorder" OR DE "Sadomasochistic Personality" OR DE "Schizoid Personality Disorder" OR DE "Schizotypal Personality Disorder"), resp.

Supplement Table 3: References of the 95 reviews included in this study

Abbass A, Town J, Driessen E. Intensive short-term dynamic psychotherapy: A systematic review and meta-analysis of outcome research. Harv Rev Psychiatry 2012;20(2):97-108.

Abbass A, Town J, Driessen E. The efficacy of short-term psychodynamic psychotherapy for depressive disorders with comorbid personality disorder. Psychiatry 2011;74(1):58-71.

Baardseth TP, Goldberg SB, Pace BT, et al. Cognitive-behavioral therapy versus other therapies: Redux. Clin Psychol Rev 2013;33(3):395-405.

Barker-Collo S, Starkey N, Theadom A. Trearment for depression following mild traumatic brain injury in adults: A meta-analysis. Brain Inj 2013;27(10):1124-1133.

Bartley CA, Hay M, Bloch MH. Meta-analysis: Aerobic exercise for the treatment of anxiety disorders. Prog Neuropsychopharmacol Biol Psychiatry 2013;45:34-39.

Barrera TL, Mott JM, Hofstein RF, et al. A meta-analytic review of exposure in group cognitive behavioral therapy for posttraumatic stress disorder. Clin Psychol Rev 2013;33(1):24-32.

Beltman MW, Oude Voshaar RC, Speckens AE. Cognitive-behavioural therapy for depression in people with a somatic disease: meta-analysis of randomized controlled trials. Br J Psychiatry 2010;197(1):11-19.

Bomyea J, Lang AJ. Emerging interventions for PTSD: Future directions for clinical care and research Neuropharmacology 2012;62:607-616.

Bontempo A, Panza KE, Bloch MH. Meta-Analysis: D-cycloserine Augmentation of Behavioral Therapy for the Treatment of Anxiety Disorders. J Clin Psychiatry 2012;73(4):533–537.

Budge SL, Moore JT, Del Re AC, et al. The effectiveness of evidence-based treatments for personality disorders when comparing treatment-as-usual and bona fide treatments. Clin Psychol Rev 2013;33:1057–1066.

Busch FN, Sandberg LS. Combined treatment of depression
Psychiatr Clin North Am 2012;35:165-179.

Casement MD, Swanson LM. A meta-analysis of imagery rehearsal for post-trauma nightmares: Effects on nightmare frequency, sleep quality, and posttraumatic stress. Clin Psychol Rev 2012;32:566–574.

Chard KM, Ricksecker EG, Healy ET, et al. Dissemination and experience with cognitive processing therapy. J Rehabil Res Dev 2012;49(5):667-78.

Chen KW, Berger CC, Manheimer E, et al. Meditative therapies for reducing anxiety: A systematic review and meta-analysis of randomized controlled trials. Dedress Anxiety 2012;29:545–562.

Chugh-Gupta N, Baldassarre FG, Vrkljan BH. A systematic review of yoga for state anxiety: Considerations for occupational therapy. Can J Occup Ther 2013;80(3):150-170.

Cody RA, Drysdale K. The Effects of Psychotherapy on Reducing Depression in Residential Aged Care: A Meta-Analytic Review. Clin Gerontol 2013;36(1):46-69.

Cuijpers P, Andersson G, Donker T, et al. Psychological treatment of depression: Results of a series of meta-analyses Nord J Psychiatry 2011;65(6):354-364.

Cuijpers P, Berking M, Andersson G, et al. A Meta-Analysis of Cognitive-Behavioral Therapy for Adult Depression, Alone and in Comparison With Other Treatments. Can J Psychiatry 2013;58(7):376-385.

Cuijpers P, Clignet F, van Meijel B, et al. Psychological treatment of depression in inpatients: a systematic review and meta-analysis. Clin Psychol Rev 2011;31(3):353-360.

Cuijpers P, de Beurs DP, van Spijker BA, et al. The effects of psychotherapy for adult depression on suicidality and hopelessness: A systematic review and meta-analysis. J Affect Disord 2013;144(3):183-190.

Cuijpers P, Driessen E, Hollon SD, et al. The efficacy of non-directive supportive therapy for adult depression: A meta-analysis. Clin Psychol Rev 2012;32:280–291.

Cuijpers P, Geraedts AS, van Oppen P, et al. Interpersonal Psychotherapy for Depression: A Meta-Analysis. Am J Psychiatry 2011;168:581–592.

Cuijpers P, Huibers M, Ebert DD, et al. How much psychotherapy is needed to treat depression? A metaregression analysis. J Affect Disord 2013;149(1-3):1-13.

Cuijpers P, Reynolds III CF, Donker T, et al. Personalized treatment of adult depression: Medication, psychotherapy, or both? A systematic review. Depress Anxiety 2012;29:855–864.

Cuijpers P, van Straten A, Hollon SD, et al. The contribution of active medication to combined treatments of psychotherapy and pharmacotherapy for adult depression: a meta-analysis Acta Psychiatr Scand 2010;121:415–423.

Cuijpers P, van Straten A, Schuurman J, et al. Psychotherapy for chronic major depression and dysthymia: A meta-analysis Clin Psychol Rev 2010;30:51–62.

Daigle MS, Pouliot L, Chagnon F, et al. Suicide attemps: Prevention of repetition. Can J Psychiatry 2011;56(10):621-629.

Dickens C, Cherrington A, Adeyemi I, et al. Characteristics of Psychological Interventions That Improve Depression in People With Coronary Heart Disease: A Systematic Review and Meta-Regression. Psychosom Med 2013;75:211-221.

Dossa NI, Hatem M. Cognitive-Behavioral Therapy versus Other PTSD Psychotherapies as Treatment for Women Victims of War-Related Violence: A Systematic Review. Scientific World Journal 2012;2012:181847. doi:10.1100/2012/181847. Epub 2012 Apr 19.

Driessen E, Cuijpers P, de Maat SCM, et al. The efficacy of short-term psychodynamic psychotherapy depression: a meta-analysis. Clin Psychol Rev 2010;30(1):25-36.

Ekers D, Webster LAD. An overview of the effectiveness of psychological therapy for depression and stepped care service delivery models. J Res Nurs 2013;18(2):171-184,

Faller H, Schuler M, Richard M, et al. Effects of psycho-oncologic interventions on emotional distress and quality of life in adult patients with cancer: systematic review and meta-analysis. J Clin Oncol 2013;31(6):782-93.

Feng CY, Chu H, Chen CH, et al. The Effect of Cognitive Behavioral Group Therapy for Depression: A Meta-Analysis 2000–2010. Worldviews Evid Based Nurs 2012;9(1):2-17.

Fritzsche A, Clamor A, von Leupoldt A. Effects of medical and psychological treatment of depression in patients with COPD e A review Respir Med 2011;105:1422-1433.

Gibbon S, Duggan C, Stoffers J, et al. Psychological interventions for antisocial personality disorder. Cochrane Database Syst Rev 2010;6: CD007668. doi:10.1002/14651858.CD007668.pub2.

Goncalves DC, Byrne GJ. Interventions for generalized anxiety disorder in older adults: Systematic review and meta-analysis J Anxiety Disord 2012;26:1–11.

Goodson J, Helstrom A, Halpern JM, et al. Treatment of posttraumatic stress disorder in US combat veterans: a meta-analytic review. Psychol Rep 2011;109(2):573-599.

Gould RL, Coulson MC, Howard RJ. Efficacy of Cognitive Behavioral Therapy for Anxiety Disorders in Older People: A Meta-Analysis and Meta-Regression of Randomized Controlled Trials. J Am Geriatr Soc 2012;60(2):218-29. DOI: 10.1111/j.1532-5415.2011.03824.xJAGS 60:218–229, 2012.

Guidi J, Fava GA, Fava M, et al. Efficacy of the sequential integration of psychotherapy and pharmacotherapy in major depressive disorder: a preliminary meta-analysis. Psychol Med 2011;41:321–331.

Gwozdziewycz N, Mehl-Madrona L. Meta-analysis of the use of narrative exposure therapy for the effects of trauma among refugee populations. Perm J 2013;17(1):70-76.

Hanrahan F, Field AP, Jones FW, et al. A meta-analysis of cognitive therapy for worry in generalized anxiety disorder. Clin Psychol Rev 2013;33(1):120-32.

Hans E, Hiller W. Effectiveness of and Dropout From Outpatient Cognitive Behavioral Therapy for Adult Unipolar Depression: A Meta-Analysis of Nonrandomized Effectiveness Studies. J Consult Clin Psychol 2013;81(1):75•88.

Hansen K, Höfling V, Kröner-Borowik T, et al. Efficacy of psychological interventions aiming to reduce chronic nightmares: a meta-analysis. Clin Psychol Rev 2013;33(1):146-55.

Hart SL, Hoyt MA, Diefenbach M, et al. Meta-Analysis of Efficacy of Interventions for Elevated Depressive Symptoms in Adults Diagnosed With Cancer. J Natl Cancer Inst 2012;104:990–1004.

Haug T, Nordgreen T, Öst LG, et al. Self-help treatment of anxiety disorders: A meta-analysis and meta-regression of effects and potential moderators Clin Psychol Rev 2012;32:425–445.

Hetrick SE, Purcell R, Garner B, et al. Combined pharmacotherapy and psychological therapies for post traumatic stress disorder (PTSD) Cochrane Database Syst Rev 2010;7:CD007316. DOI:10.1002/14651858.CD007316.pub2.

Ho MSK, Lee CW. Cognitive behaviour therapy versus eye movement desensitization and reprocessing for post-traumatic disorder – is it all in the homework then? Eur Rev Appl Psychol 2012;62:253–260.

Hobbs JDJ, Kushner MG, Lee SS, et al. Meta-analysis of Supplemental Treatment for Depressive and Anxiety Disorders in Patients Being Treated for Alcohol Dependence. Am J Addict 2011;20:319–329.

Hofmann SG, Sawyer AT, Witt AA, et al. The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. J Consult Clin Psychol 2010;78(2):169-183.

Huntley AL, Araya R, Salisbury C. Group psychological therapies for depression in the community: systematic review and meta-analysis. Br J Psychiatry 2012;200:184–190. doi: 10.1192/bjp.bp.111.092049

Imel ZE, Laska, K, Jakupcak M, et al. Meta-Analysis of Dropout in Treatments for Posttraumatic Stress Disorder. J Consult Clin Psychol 2013;81(3)394-404.

IsHak WW, Ha K, Kapitanski N, et al. The Impact of Psychotherapy, Pharmacotherapy, and Their Combination on Quality of Life in Depression. Harv Rev Psychiatry 2011;19:277–289.

Jakobsen JC, Hansen JL, Simonsen E, et al. The effect of adding psychodynamic therapy to antidepressants in patients with major depressive disorder. A systematic review of randomized clinical trials with meta-analyses and trial sequential analyses J Affect Disord 2012;137:4–14.

Jakobsen JC, Hansen JL, Simonsen S, et al. Effects of cognitive therapy versus interpersonal psychotherapy in patients with major depressive disorder: a systematic review of randomized clinical trials with meta-analyses and trial sequential analyses. Psychol Med 2012;42:1343–1357. doi:10.1017/S0033291711002236.

Krishna M, Honagodu A, Rajendra R, et al. A systematic review and meta-analysis of group psychotherapy for sub-clinical depression in older adults. Int J of Geriatr Psychiatry 2013;28(9):881-888.

Krishna M, Jauhari A, Lepping P, et al. Is group psychotherapy effective in older adults with depression? A systematic review. Int J of Geriatr Psychiatry. 2011;26(4):331-340.

Leisenring F, Rabung S. Long-term psychodynamic psychotherapy in complex mental disorders: update of a meta-analysis. Br J Psychiatry 2011;199(1):15-22.

Luciano M, Del Vecchio V, Giacco D, et al. A 'family affair'? The impact of family psychoeducational interventions on depression Expert Rev. Neurother 2012;12(1):83–92.

Markowitz SM, Gonzalez JS, Wilkinson JL, et al. A Review of Treating Depression in Diabetes: Emerging Findings. Psychosomatics 2011;52:1–18.

Mavrides N, Nemeroff C. Treatment of depression in cardiovascular disease. Depress Anxiety 2013;30(4):328-41.

Nenova M, Morris L, Paul L, et al. Psychosocial Interventions With Cognitive-Behavioral Components for the Treatment of Cancer-Related Traumatic Stress Symptoms: A Review of Randomized Controlled Trials. J Cogn Psychother 2013;27(3)258-284.

Nickerson A, Bryant RA, Silove D, et al. A critical review of psychological treatments of posttraumatic stress disorder in refugees. Clin Psychol Rev 2011;31:399–417.

Oestergaard S, Møldrup C. Optimal duration of combined psychotherapy and pharmacotherapy for patients with moderate and severe depression: A meta-analysis. J Affect Disord 2011;131:24–36.

Olatunji BO, Davis ML, Powers MB, et al. Cognitive-behavioral therapy for obsessive-compulsive disorder: A meta-analysis of treatment outcome and moderators. J Psychiatr Res 2013;47(1):33-41.

Opris D, Pintea S, Garcia-Palacios A, et al. Virtual reality exposure therapy in anxiety disorders: A quantitative meta-analysis. Depress Anxiety 2012;29(2):85-93.

Palic S, Elklit A. Psychosocial treatment of post-traumatic stress disorder in adult refugees: a systematic review of prospective treatment outcome studies and a critique. J Affect Disord 2011;131(1-3):8-23.

Piet J, Hougaard E. The effect of mindfulness-based cognitive therapy for prevention of relapse in recurrent major depressive disorder: a systematic review and meta-analysis. Clin Psychol Rev 2011;31(6):1032-1040.

Possemato K, The current state of intervention research for posttraumatic stress disorder within the primary care setting. J Clin Psychol Med Settings 2011;18(3):268-280.

Powers MB, Halpern JM, Ferenschak MP, et al. A meta-analytic review of prolonged exposure for posttraumatic stress disorder. Clin Psychol Rev 2010;30(6):635-641.

Rakofsky JJ, Dunlop BW, Treating Nonspecific Anxiety and Anxiety Disorders in Patients With Bipolar Disorder: A Review. J Clin Psychiatry 2011;72(1):81-91.

Richards D, Richardson T. Computer-based psychological treatments for depression: A systematic review and meta-analysis Clin Psychol Rev 2012;32:329–342.

Rizzo M, Creed F, Goldberg D, et al. A systematic review of non-pharmacological treatments for depression in people with chronic physical health problems. J Psychosom Res 2011;71(1):18-27.

Roberts NP, Kitchiner NJ, Kenardy J, et al. Early psychological interventions to treat acute traumatic stress symptoms. Cochrane Database Syst Rev 2010;3:CD007944. doi:10.1002/14651858.CD007944.pub2.

Rosenberg Edwards A. Psychotherapy and Pharmacotherapy for Social Anxiety Disorder: A Comprehensive Meta-Analysis. Dissertation abstracts international: Section B: the Sciences and Engineering 2011;72(4-B):2433-2601.

Roshanaei-Moghaddam B, Pauly MC, Atkins DC, et al. Relative effects of CBT and pharmacotherapy in depression versus anxiety: Is medication somewhat better for depression, and CBT somewhat better for anxiety? Depress Anxiety 2011;28:560–567.

Samad Z, Brealey S, Gilbody S. The effectiveness of behavioural therapy for the treatment of depression in older adults: a meta-analysis. Int J of Geriatr Psychiatry 2011;26(12):1211-1220.

Sanchez-Meca J, Rosa-Alcázar AI, Marín-Martínez F, et al. Psychological treatment of panic disorder with or without agoraphobia: a meta-analyis. Clin Psychol Rev 2010;30(1):37-50.

Schoenfeld FB, DeViva JC, Manber R. Treatment of sleep disturbances in posttraumatic stress disorder: A review. J Rehabil Res Dev 2012;49(5):729–752.

Sempértegui GA, Karreman A, Arntz A, et al. Schema therapy for borderline personality disorder: a comprehensive review of its empirical foundations, effectiveness and implementation possibilities. Clin Psychol Rev 2013;33(3):426-47.

Sloan DM, Bovin MJ, Schnurr PP. Review of group treatment for PTSD. J Rehabil Res Dev 2012;49(5):689-701.

Sloan DM, Feinstein BA, Gallagher MW, et al. Efficiacy of Group Treatment for Posttraumatic Stress Disorder Symptoms: A Meta-Analysis. Psychol Trauma 2013;5(2):176-183.

Sloan DM, Gallagher MW, Feinstein BA, et al. Efficacy of telehealth treatments for posttraumatic stress-related symptoms: a meta-analysis. Cogn Behav Ther 2011;40(2):111-125.

Spielmans GI, Berman MI, Usitalo AN. Psychotherapy Versus Second-Generation Antidepressants in the Treatment of Depression A Meta-Analysis. J Nerv Ment Dis 2011;199:142–149.

Spijker J, van Straten A, Bockting CL, et al. Psychotherapy, Antidepressants, and Their Combination for Chronic Major Depressive Disorder: A Systematic Review. Can J Psychiatry 2013:58(7):386-392.

Stagg EK, Lazenby M. Best Practices for the Nonpharmacological Treatment of Depression at the End of Life. Am J Hosp Palliat Care 2012;29(3):183-194.

Steenkamp MM, Litz BT Psychotherapy for military-related posttraumatic stress disorder: review of the evidence. Clin Psychol Rev 2013;33(1):45-53.

Stoffers JM, Völlm BA, Rücker G, et al. Psychological therapies for people with borderline personality disorder (Review), Cochrane Database Syst Rev 2012;8:CD005652. doi:10.1002/14651858.CD005652.pub2.

Van Dam D, Vedel E, Ehring T, et al. Psychological treatments for concurrent posttraumatic stress disorder and substance use disorder: A systematic review. Clin Psychol Rev 2012;32:202–214.

Van der Feltz-Cornelis CM, Nuyen J, Stoop C, et al. Effect of interventions for major depressive disorder and significant depressive symptoms in patients with diabetes mellitus: a systematic review and meta-analysis Gen Hosp Psychiatry 2010;32:380–395.

Van der Heiden C. Metacognitions in generalized anxiety disorder: theoretical and practical perspectives. Expert Rev Neurother 2013;13(2):135-141.

Van Emmerik AA, Reijntjes A, Kamphuis JH. Writing Therapy for Posttraumatic Stress: A Meta-Analysis. Psychother Psychosom 2013;82:82-88.

Van Hees ML, Rotter T, Ellermann T, et al. The effectiveness of individual interpersonal psychotherapy as a treatment for major depressive disorder in adult outpatients: A systematic review. BMC Psychiatry 2013;13:22. doi:10.1186/1471-244X-13-22.

Van Straten A, Geraedts A, Verdonck-de Leeuw IM, et al. Psychological treatment of depressive symptoms in patients with medical disorders: a meta-analysis. J Psychosom Res 2010;69(1):23-32.

Vøllestad J, Nielsen MB, Nielsen GH Mindfulness- and acceptance-based interventions for anxiety disorders: A systematic review and meta-analysis. Br J Clin Psychol 2012;51:239–260.

Watts BV, Schnurr PP, Mayo L, et al. Meta-Analysis of the Efficacy of Treatments for Posttraumatic Stress Disorder. J Clin Psychiatry 2013;74(6):541-550.

Supplement Table 4: Journals in which the 95 reviews were published

Journal	2010	2011	2012	2013	Total number
Clin Psychol Rev	4	3	5	8	20
Depress Anxiety	-	1	3	1	5
J Affect Disord	-	2	1	2	5
Cochrane Database Syst Rev	3	-	1	-	4
Br J Psychiatry	1	1	1	-	3
Can J Psychiatry	-	1	-	2	3
Int J of Geriatr Psychiatry	-	2	-	1	3
J Clin Psychiatry	-	1	1	1	3
Expert Rev Neurother	-	-	1	1	2
Harv Rev Psychiatry	-	1	1	-	2
J Consult Clin Psychol	1	-	-	1	2
J Psychosom Res	1	1	-	-	2
Psychol Med	-	1	1	-	2
Acta Psychiatr Scand	1	-	-	-	1
Am J Addict	-	1	-	-	1
Am J Hosp Palliat Care	-	-	1	-	1
Am J Psychiatry	-	1	-	-	1
BMC Psychiatry	-	-	-	1	1
Brain inj	-	-	-	1	1
Br J Clin Psychol	-	-	1	-	1
Can J Occup Ther	-	-	-	1	1
Clin Gerontol	-	-	-	1	1
Cogn Behav Ther	-	1	-	-	1
Dissertations Abstracts international: Section B: The Sciences and Engineering	-	1	-	-	1
Eur Rev Appl Psychol	-	-	1	-	1
Gen Hosp Psychiatry	1	-	-	-	1
J Am Geriatr Soc	-	-	1	-	1
J Anxiety Disord	-	-	1	-	1

J Clin Oncol	-	-	-	1	1
J Clin Psychol Med Settings	-	1	-	-	1
J Cogn Psychother	-	-	-	1	1
J Natl Cancer Inst	-	-	1	-	1
J Nerv Ment Dis	-	1	-	-	1
J Psychiatr Res	-	-	-	1	1
J Rehabil Res Dev	-	-	1	-	1
J Res Nurs	-	-	-	1	1
Neuropharmacology	-	-	1	-	1
Nord J Psychiatry	-	1	-	-	1
Perm J	-	-	-	1	1
Prog Neuropsychopharmacol Biol Psychiatry	-	-	-	1	1
Psychiatr Clin North Am	-	-	1	-	1
Psychiatry	-	1	-	-	1
Psychol Rep	-	1	-	-	1
Psychol Trauma	-	-	-	1	1
Psychosom Med	-	-	-	1	1
Psychosomatics	-	1	-	-	1
Psychother Psychosom	-	-	-	1	1
Respir Med	-	1	-	-	1
Scientific World Journal	-	-	1	-	1
Worldviews Evid Based Nurs	-	-	1	-	1

Supplement Table 5: Mandatory disclosure of Conflicts of Interest by Journal – last accessed June 8, 2014

Journal	Personal COI	Financial COI	Non-Financial COI	Inclusion of own primary study	Researcher allegiance
Acta Psychiatr Scand	no	Yes	No	No	No
Am J Addict	no	Yes	Yes	No	No
Am J Hosp Palliat Care	no	yes	No	No	No
Am J Psychiatry	no	yes	No	No	No
BMC Psychiatry	no	no	No	No	No
Brain Inj	yes	yes	No	No	No
Br J Clin Psychol	no	no	No	No	No
Br J Psychiatry	yes	yes	Yes	No	No
Can J Occup Ther	no	no	No	No	No
Can J Psychiatry	yes	yes	Yes	No	No
Clin Gerontol	no	no	No	No	No
Clin Psychol Rev	yes	yes	Yes	No	No
Cochrane Database Syst Rev	yes	yes	Yes	yes	No
Cogn Behav Ther	no	no	No	No	No
Depress Anxiety	yes	yes	No	No	No
Dissertations Abstracts international: Section B: The Sciences and Engineering	no	no	No	No	No
Eur Rev Appl Psychol	yes	yes	Yes	No	No
Expert Rev Neurother	yes	yes	Yes	No	No
Gen Hosp Psychiatry	yes	yes	Yes	No	No
Harv Rev Psychiatry	yes	yes	No	No	No
Int J of Geriatr Psychiatry	yes	yes	No	No	No
J Affect Disord	yes	yes	Yes	No	No
J Am Geriatr Soc	yes	yes	Yes	No	No

J Anxiety Disord	yes	yes	Yes	No	No
J Clin Oncol	yes	yes	No	No	No
J Clin Psychiatry	yes	yes	No	No	No
J Clin Psychol Med Settings	no	yes	No	No	No
J Cogn Psychother	unclear	unclear	Unclear	Unclear	Unclear
J Consult Clin Psychol	yes	yes	No	No	No
J Natl Cancer Inst	no	yes	No	No	No
J Nerv Ment Dis	yes	yes	Yes	No	No
J Psychiatr Res	yes	yes	No	No	yes
J Psychosom Res	yes	yes	Yes	No	No
J Rehabil Res Dev	yes	yes	No	No	No
J Res Nurs	no	yes	No	No	No
Neuropharmacology	yes	yes	Yes	No	No
Nord J Psychiatry	no	yes	No	No	No
Perm J	yes	yes	No	yes	No
Prog Neuropsychopharmacol Biol Psychiatry	yes	yes	Yes	No	No
Psychiatr Clin North Am	no	yes	No	No	No
Psychiatry	no	no	No	No	No
Psychol Med	yes	yes	No	No	No
Psychol Rep	no	no	No	No	No
Psychol Trauma	yes	yes	Yes	No	yes
Psychosom Med	yes	yes	No	No	No
Psychosomatics	no	yes	No	No	No
Psychother Psychosom	no	yes	No	No	No
Respir Med	yes	yes	Yes	No	No
Scientific World Journal	no	no	No	No	No
Worldviews Evid Based Nurs	no	yes	No	No	No

Supplement Table 6: References of the own primary studies included into 34 reviews by the review authors

Abbass AA, Campbell S, Magee K, et al. Intensive shortterm dynamic psychotherapy to reduce rates of emergency department return visits for patients with medically unexplained symptoms: preliminary evidence from a pre-post intervention study. CJEM 2009;11(6):529–534.

Abbass A. Intensive short-term dynamic psychotherapy in a private psychiatric office: Clinical and cost effectiveness. Am J Psychother 2002;56:225-232.

Abbass A. Intensive short-term dynamic psychotherapy of treatment-resistant depression: a pilot study. Depress Anxiety 2006;23:449–452.

Abbass A. Modified short-term dynamic psychotherapy in patients with bipolar disorder. Preliminary report of a case series. Can Child Psychiatry Rev 2002;11(1):19–22.

Abbass A. Office based research in intensive short-term dynamic psychotherapy (ISTDP): data from the first 6 years of practice. Ad Hoc Bull Short Term Dyn Psychother 2002;6(2):5–14.

Abbass A, Sheldon A, Gyra A, et al. Intensive short-term dynamic psychotherapy for DSM-IV personality disorders. J Nerv Ment Dis 2008;196:211–216.

Abbass A. Small-group videotape training for psychotherapy skill development. Acad Psychiatry 2004;28:151–155.

Andersson G, Waara J, Jonsson U, et al. Internet-based self-help versus one-session exposure in the treatment of spider phobia: a randomized controlled trial. Cogn Behav Ther 2009;38:114-120.

Araya R, Rojas G, Fritsch R, et al. Treating depression in primary care in low-income women in Santiago, Chile: a randomised controlled trial. Lancet 2003;361:995–1000.

Arntz A, Dietzel R, Dreessen L. Assumptions in borderline personality disorder, specificity, stability and relationship with etiological factors. Behav Res Ther 1999;37(6):545–557.

Arntz A, Dreessen L, Schouten E, et al. Beliefs in personality disorders: A test with the Personality Disorder Belief Questionnaire. Behav Res Ther 2004;42(10):1215–1225.

Arntz A, Klokman J, Sieswerda S. An experimental test of the schema mode model of borderline personality disorder. J Behav Ther Exp Psychiatry 2005;36(3):226–239.

Arntz A, Weertman A, Salet S. Interpretation bias in Cluster-C and borderline personality disorders. Behav Res Ther 2011;49(8):472–481.

Beck JG, Coffey SF, Foy DW, et al. Group cognitive behavior therapy for chronic posttraumatic stress disorder: An initial randomized pilot study. Behav Ther 2009;40:82–92.

Bisson JI, Shepherd JP, Joy D, et al. Early cognitive-behavioural therapy for post-traumatic stress symptoms after physical injury. Br J Psychiatry 2004;184:63-69.

Bormann JE, Thorp SR, Wetherell JL, et al. Meditation-Based Mantram Intervention for Veterans With Posttraumatic Stress Disorder: A Randomized Trial. Psychol Trauma 2012, March. Advance online publication. doi: 10.1037/a0027522.

Botella C, Garcia-Palacios A, Villa H, et al. Virtual reality exposure in the treatment of panic disorder and agoraphobia: a controlled study. Clin Psychol Psychother 2007;14:164–175.

Chard KM. An evaluation of cognitive processing therapy for the treatment of posttraumatic stress disorder related to childhood sexual abuse. J Consult Clin Psychol 2005;73(5):965–971.

Chard KM, Schumm JA, McIlvain SM, et al. Exploring the efficacy of a residential treatment for veterans with PTSD and traumatic brain injury. J Trauma Stress 2011;24(3):347–351.

Chard KM, Schumm JA, Owens GP, et al. A comparison of OEF and OIF veterans and Vietnam veterans receiving cognitive processing therapy. J Trauma Stress 2010;23(1):25–32.

De Jonghe F, Hendriksen M, van Aalst G, et al. Psychotherapy alone and combined with pharmacotherapy in the treatment of depression. Br J Psychiatry 2004;185:37-45.

Dickhaut V, Arntz A. Combined group and individual schema therapy for borderline personality disorder: A pilot study. J Behav Ther Exp Psychiatr 2014;45:242-251.

Dimidjian S, Hollon SD, Dobson KS, et al. Randomized trial of behavioral activation, cognitive therapy, and antidepressant medication in the acute treatment of adults with major depression. J Consult Clin Psychol 2006;74:658–670.

DuHamel KN, Mosher CE, Winkel G, et al. Randomized clinical trial of Telefone – administered cognitive-behavioral therapy to reduce posttraumatic stress disorder and distress symptoms after hematopoietic stem-cell transplantation. J Clin Oncol 2010;28(23):3754-3761.

Ekers D, Richards D, Gilbody S. A meta-analysis of behavioural therapy for depression. Psychol Med 2008;38(5):611-623.

Fava GA, Rafanelli C, Grandi S, et al. Six-year outcome for cognitive behavioral treatment of residual symptoms in major depression. Am J Psychiatry 1998;155:1443–1445.

Fava GA, Ruini C, Rafanelli C, et al. Six-year outcome of cognitive behavior therapy for prevention of recurrent depression. Am J Psychiatry 2004;161:1872–1876.

Fiorillo A, Malangone C, Del Vecchio VC, et al. Maj The effect of family psychoeducational interventions on patients with depression. Eur Psychiatry 2011;26:7.

Foa EB, Dancu CV, Hembree EA, et al. A Comparison of exposure therapy, stress inoculation training, and their combination for reducing posttraumatic stress disorder in female assault victims. J Consult Clin Psychol 1999;67(2):194-200.

Foa EB, Hembree EA, Cahill SP, et al. Randomized trial of prolonged exposure for posttraumatic stress disorder with and without cognitive restructuring: outcome at academic and community clinics. J Consult Clin Psychol 2005;73(5):953-964.

Foa EB, Rothbaum BO, Riggs DS, et al. Treatment of posttraumatic stress disorder in rape victims : A comparison between cognitive-behavioral procedures and counseling. J Consult Clin Psychol 1991;59(5):715-723.

Friedman MJ, Marmar CR, Baker DG, et al. Randornized, double-blind comparison of sertraline and placebo for posttraumatic stress disorder in a Departrnent ofVeterans Affairs setting. J Clin Psychiatry 2007;68(5):711- 720.

Furmark T, Carlbring P, Hedman E, et al. Guided and unguided self-help for social anxiety disorder: randomized controlled trial. Br J Psychiatry 2009;195(5):440-447.

Garcia-Palacios A, Hoffman H, Carlin A, et al. Virtual reality in the treatment of spider phobia: a controlled study. Behav Res Ther 2002;40:983–993.

Giesen-Bloo J, van Dyck R, Spinhoven P, et al. Outpatient psychotherapy for borderline personality disorder randomized trial of schema-focused therapy vs. transference-focused psychotherapy. Arch Gen Psychiatry 2006;63(6):649–658.

Gilboa-Schechtman E, Foa EB, Shafran N, et al. Prolonged exposure vs dynamic therapy for adolescent PTSD: A pilot randomized controlled trial. J Am Acad Child Adolesc Psychiatry 2010;49(10):1034-1042.

Gray MJ, Schorr Y, Nash W, et al. Adaptive disclosure: An open trial of a novel exposure-based intervention for service members with combat-related psychological stress injuries. Behav Ther 2012;43:407–415.

Hellstrom K, Öst LG. One-session therapist directed exposure vs. 2 forms of manual directed self-exposure in the treatment of spider phobia. Behav Res Ther 1995;33:959–965.

Huband N, McMurran M, Evans C, et al. Social problem-solving plus psychoeducation for adults with personality disorder : pragmatic randomised controlled trial. Br J Psychiatry 2007;190:307-313.

Joling KJ, van Hout HP, van't Veer-Tazelaar PJ, et al. How effective is bibliotherapy for very old adults with subthreshold depression? A randomized controlled trial. Am J Geriatr Psychiatry 2011;19(3):256-265.

Katon WJ, Von Korff M, Lin EH, et al. The Pathways Study: a randomized trial of collaborative care in patients with diabetes and depression. Arch Gen Psychiatry 2004;61:1042–1049.

Lee CW, Gavriel H, Drummond PD, et al. Treatment of PTSD: stress inoculation training with prolonged exposure compared to EMDR. J Clin Psychol 2002;58(9):1071–1089.

Li M, Chen K, Mo Z. Use of qigong therapy in the detoxification of heroin addicts. Altern Ther Health Med 2002;8:50–59.

Lobbestael J, Arntz A, Cima M, et al. Effects of induced anger in patients with antisocial personality disorder. Psychol Med 2009;39(4):557–568.

Lobbestael J, Arntz A. Emotional, cognitive and physiological correlates of abuse-related stress in borderline and antisocial personality disorder. Behav Res Ther 2010;48(2):116–124.

Lobbestael J, Arntz A, Sieswerda S. Schema modes and childhood abuse in borderline and antisocial patients. J Behav Ther Exp Psychiatry 2005;36(3):240–253.

Lobbestael J, Arntz A. The state dependency of cognitive schemas in antisocial patients. Psychiatry Res 2012;198:452-456.

Markowitz JC, Kocsis JH, Bleiberg KL, et al. A comparative trial of psychotherapy and pharmacotherapy for "pure" dysthymic patients. J Affect Dis 2005;89:167–175.

Markowitz JC, Kocsis JH, Christos P, et al. Pilot study of interpersonal psychotherapy for dysthymic patients with secondary alcohol abuse or dependence. J Nerv Ment Dis 2008;196:468–474.

Markowitz JC, Kocsis JH, Fishman B, et al. Treatment of depressive symptoms in human immunodeficiency virus-positive patients. Arch Gen Psychiatry 1998;55:452–457.

McDonagh A, Friedman M, McHugo G, et al. Randomized trial of cognitivebehavioral
therapy for chronic posttraumatic stress disorder in adult female survivors of childhood sexual abuse. J Consult Clin Psycho 2005;73(3):515-524.

Monson CM, Schnurr PP, Resick PA, et al. Cognitive processing therapy for veterans with military-related posttraumatic stress disorder. J Consult Clin Psychol 2006;74(5):898–907.

Nacasch N, Foa EB, Huppert JD, et al. The efficacy of prolonged exposure therapy for combat and terror-related PTSD: A randomized control comparison with treatment as usual. Am J Psychiatry 2011;72(9):1174-1180.

Nadort M, Arntz A, Smit JH, et al. Implementation of outpatient schema therapy for borderline personality disorder with versus without crisis support of the therapist outside office hours: A randomized trial. Behav Res Ther 2009;47:961–973.

Nadort M, van Dyck R, Smit JA, et al. Three preparatory studies for promoting implementation of outpatient schema therapy for borderline personality disorder in general mental health care. Behav Res Ther 2009;47(11):938–945.

Neylan TC, Lenoci M, Maglione ML, et al. The effect of nefazodone on subjective and objective sleep quality in posttraumatic stress disorder. J Clin Psychiatry 2003;64(4):445–450.

Neylan TC, Lenoci M, Samuelson KW, et al. No improvement of post-traumatic stress disorder symptoms with guanfacine treat-ment. Am J Psychiatry 2006;163(12):2186–2188.

Nordin S, Carlbring P, Cuijpers P, et al. Expanding the limits of bibliotherapy for panic disorder: Randomized trial of self-help without support but with a clear deadline. Behav Ther 2010;41(3):267-276.

Öst LG, Salkovskis PM, Hellstrom K. One-session therapist-directed exposure vs. Self-exposure in the treatment of spider phobia. Behav Ther 1991;22:407-422.

Palic S, Elkit A. An explorative outcome study of CBT-based multidisciplinary treatment in a diverse group of refugees from a Danish treatment centre for rehabilitation of traumatized refugees. Torture 2009;19(3):248-270.

Perlis RH, Nierenberg AA, Alpert JE, et al. Effects of adding cognitive therapy to fluoxetine dose increase on risk of relapse and residual symptoms in continuation treatment of major depressive disorder. J Clin Psychopharmacol 2002;22:474–480.

Reiss N, Lieb K, Arntz A, et al. Responding to the treatment challenge of patients with severe BPD: results of three pilot studies of inpatient schema therapy. Behav Cog Psychother 2014;42:355-367.

Resick PA, Galovski TE, O'Brien Uhlmansiek M, et al. A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interper-sonal violence. J Consult Clin Psychol 2008;76(2):243–258.

Resick PA, Nishith P, Weaver TL, et al. A comparison of cognitive-processing therapy with pro-longed exposure and a waiting condition for the treatment of chronic posttraumatic stress disorder in female rape vic-tims. J Consult Clin Psychol 2002;70(4):867–879.

Schindler A, Hiller W. Therapieeffekte und Responseraten bei unipolar deperssiven Patienten einer verhaltenstherapeutischen Hochschulambulanz [Therapy effects and response rates of cognitive-bahavioral treatment for unipolar depressive patients in an outpatient clinic] Zeitschrift für Klinische Psychologie und Psychotherapie: Forschung und Praxis 2010;39:107-115.

Schnurr PP, Friedman MJ, Engel CC, et al. Cognitive behavioral therapy for posttraumatic stress disorder in women: a randomized controlled trial. JAMA 2007;297(8):820-830.

Schnurr PP, Friedman MJ, Foy DW, et al. Randomized trial of traumafocused group therapy for posttraumatic stress disorder: results li•om a department of veterans affairs eooperative study. Arch Gen Psychiatry 2003;60(5):481-489.

Schnurr PP, Friedman MJ, Lavori PW, et al. Design of Department of Veterans Affairs Cooperative Study No. 420: Group treatment of posttraumatic stress disorder. Control Clin Trials 2001;22(1):74–88.

Shelton RC, Haman KL, Rapaport MH, et al. A randomized, double-blind, active-control study of sertraline versus venlafaxine XR in major depressive disorder. J Clin Psychiatry 2006;67:1674–1681.

Sieswerda S, Arntz A, Kindt M. Successful psychotherapy reduces hypervigilance in borderline personality disorder. Behav Cog Psychotherapy 2007;35(4):387–402.

Sieswerda S, Arntz A, Mertens I, et al. Hypervigilance in patients with borderline personality disorder: Specificity, automaticity, and predictors. Behav Res Ther 2007;45(5):1011–1024.

Spinhoven P, Giesen-Bloo J, van Dyck R, et al. Can assessors and therapists predict the outcome of long-term psychotherapy in borderline personality disorder? J Clin Psychol 2008;64(6):667–686.

Spinhoven P, Giesen-Bloo J, van Dyck R, et al. The therapeutic alliance in schema-focused therapy and transference-focused psychotherapy for borderline personality disorder. J Consult Clin Psychol 2007;75(1):104–115.

Swanson LM, Favorite TK, Horin E, et al. A combined group treatment for nightmares and insomnia in combat veterans: A pilot study. J Trauma Stress 2009;22(6):639–642.

Taylor DT, Meader N, Bird V, et al. Pharmacology subgroup of the National Institute for Health and Clinical Excellence Guideline Development Group for Depression in Chronic Physical Health Problems. Pharmacological interventions for people with depression and chronic physical health problems: Systematic review and meta-analyses of safety and efficacy. Br J Psychiatry 2011;198:179–188.

Van Asselt ADI, Dirksen CD, Arntz A, et al. Outpatient psychotherapy for borderline personality disorder: Cost effectiveness of schema-focused therapy versus transference focused psychotherapy. Br J Psychiatry 2008;192:450–457.

Van der Heiden C, Muris P, van der Molen HT. Randomized comrolled rrial on the cffectiveness of meracognirive therapy and inrolerance-of-uncerrainry rherapy for generalized anxiery disorder. Bebav Res Ther 2012;50(2):100-109.

Van Emmerik AAP, Kamphuis JH, Ernmelkamp PMG. Treating acute stress disorder and posttraumatic stress disorder with cognitive behavioral therapy or structured writing therapy: a randomized controlled trial. Psychother Psychosom 2008;77:93-100.

Vilhauer JS, Young S, Kealoha C, et al. Treating major depression by creating positive expectations for the future: a pilot study for the effectiveness of future directed therapy (FDT) on symptom severity and quality of life. CNS Neurosci Ther 2012;18(2):102-109.

Watts BV, Landon B, Groft A, et al. A sharn controlled study of repetitive transcranial magnetic stimulation for posttraumatic stress disorder. Brain Stimul 2012;5(1):38-43.

Willemse GRWM, Smit F, Cuijpers P, et al. Minimal-contact psychotherapy for sub-threshold depression in primary care. Br J Psychiatry 2004;185: 416-421.

Williams Jr JW, Katon W, Lin EH, et al. The effectiveness of depression care management on diabetesrelated outcomes in older patients. Ann Intern Med 2004;140:1015–1024.

Lieb et al., BMJ Open submission Checklist of items to include when reporting a systematic review or meta-analysis

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	n.a.
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	5
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Suppl Tables 1 and 2

Section/topic	#	Checklist item	Reported on page #
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	5 and Fig. 1
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	n.a.
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	7
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	n.a.
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	n.a.
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	n.a.
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	n.a.
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Fig. 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	n.a.
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome-level assessment (see Item 12).	n.a.
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group and (b) effect estimates and	n.a.

Section/topic	#	Checklist item	Reported on page #
		confidence intervals, ideally with a forest plot.	
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	n.a.
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	9
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression) (see Item 16).	n.a.
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., health care providers, users, and policy makers).	10f.
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review level (e.g., incomplete retrieval of identified research, reporting bias).	12
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	13
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	13