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Cognitive Behavior Therapy for Generalized Anxiety Disorder: Is CBT Equally Efficacious

in Adults of Working Age and Older Adults?

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Abstract

The current meta-analysis compared the efficacy of CBT for GAD between adults of working age and older people. In addition, we conducted a qualitative content analysis of treatment protocols used in studies with older clients to explore potential factors that may enhance treatment outcomes with this particular client group. Applying the inclusion criteria resulted in the identification of 15 studies with 22 comparisons between CBT and control groups (770 patients). When examining overall effect sizes for CBT for GAD between older people and adults of working age there were no statistically significant differences in outcome. However, overall effect size of CBT for GAD was moderate for older people ($g = 0.55$, 95% CI 0.22-0.88) and large for adults of working age ($g = 0.94$, 95% CI 0.52-1.36), suggesting that there is still room for improvement in CBT with older people. The main difference in outcome between CBT for GAD between the two age groups was related to methodological quality in that no older people studies used an intention-to-treat design. The content analysis demonstrated that studies with older clients were conducted according to robust CBT protocols but did not take account of gerontological evidence to make them more age-appropriate.
198/200 words

Introduction

Anxiety disorders are highly prevalent among older people and are associated with increased disability, poor quality of life, and cognitive impairment (Bower, Wetherell, Mon, & Lenze, 2015). Despite these long-term negative consequences of late life anxiety and the fact that it may be more common than later life depression, anxiety disorders are often underestimated, undertreated, and poorly studied in older people (Alwahhabi, 2003: Bryant, Jackson, & Ames, 2008). With the increase in longevity evidenced across the world, common mental disorders such as anxiety disorders are expected to become more prevalent in older age and older people are likely to demand greater access to psychological therapy. Therefore, finding suitable treatments for older clients is important as it has the potential to help individuals manage to live with challenging situations more effectively and facilitate their active aging. Over time, it also has the potential to reduce an economic pressure on services.

Although cognitive behavioral therapy (CBT) has established itself as an efficacious and appropriate psychological treatment for use with individuals with anxiety disorders across the lifespan (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012), common practice among older clients with an anxiety disorder still entails the prescription of medications (Schuurmans & van Balkom, 2011). A recent study by Oude Voshaar et al. (2015) explored characteristics of older clients with an anxiety disorder who died by suicide in comparison to younger clients and demonstrated that the proportion of older clients receiving psychological treatment was low (21%) and significantly lower compared to younger clients (30%). In order to challenge such age discrimination in treatment options, there is an urgent need for research to better understand whether the recommended psychological treatments for anxiety disorders such as CBT report equivalent outcomes in adults of working age and older adults.

In order to have enough studies to allow a direct precise comparison between treatment outcomes in the two different age groups, adults of working age and older adults,

the current meta-analysis will focus on the efficacy of CBT for Generalized anxiety disorder (GAD). GAD is often referred to as the most common late-life anxiety disorder with estimated 6-month to 1-year prevalence ranging from 1.0% to 7.3% (Schuurmans & Balkom, 2011). Thus, most existing randomized control trials (RCTs) that examined the effects of CBT for anxiety disorders with specific focus on older adults have recruited participants with GAD.

Furthermore, naturalistic follow up of people with GAD, unlike other anxiety disorders, has established that this is a condition that does not spontaneously remit (Lenze et al., 2005). This may mean that chronicity for GAD in older people may be present for decades rather than years. Unless people have access to evidence-based treatments such as CBT they will not necessarily get better and are being consigned to a future filled with worry and apprehensiveness. Treatment for GAD using CBT does result in symptomatic improvement (Durham, Chambers, Macdonald, Power, & Major, 2003). However, effect sizes are not as strong for GAD as they are for other anxiety disorders (Hofmann & Smits, 2008) and more treatment improvements in CBT for people experiencing GAD remains an important target (Hanrahan, Field, Jones, & Davey, 2013).

There are several existing meta-analyses focused on assessing the efficacy of CBT for GAD. However, most of these reviews target one specific age group, either adults of working age (Haby, Donnelly, Corry, & Vos, 2006; Hanrahan et al., 2013; Mitte, 2005) or older people (Gonçalves & Byrne, 2012). Based on the findings from these separate meta-analyses, a number of studies have commented that CBT appears to be less efficacious for anxiety disorders with older people (e.g., Gorenstein & Papp, 2007; Wetherell, Lenze, & Stanley, 2005) in comparison for those reported for adults of working age.

However, the conclusion about differential efficacy of treatments using separate meta-analyses is problematic as it is unclear how valid these comparisons are given differences in

methodology and levels of heterogeneity (Gould, Coulson, & Howard, 2012). The apparent difference in efficacy between the two datasets (older people and adults of working age) is intriguing as there is a point of overlap between the groups given that a number of earlier individual treatment trials of CBT for GAD in older people recruited participants aged 55 years and above into their studies. Given the change in demography around aging, at least some of these participants would more realistically be recruited as an adult of working age. Thus if there is less efficacy evident from these studies, it does raise the question as to why this occurs, as it is unlikely solely to be accounted for by increased frailty or as a result of confrontation of age-related challenges in these studies.

A recent meta-analysis of RCTs examining the efficacy of psychological treatments for GAD (Cuijpers et al., 2014) has compared treatment outcomes in the two different age groups within their single meta-analysis; although this was not the primary focus of Cuijpers et al. (2014). The limitation of this comprehensive study is that there is heterogeneity in treatment conditions as well as in control conditions used in selected studies. The authors included RCTs in which the effects of different types of psychological treatment for GAD were compared with either a control group, another psychological treatment (e.g., CBT vs psychodynamic), or a pharmacological treatment. In addition, the study also included RCTs using different format of treatment delivery such as traditional face to face, web-based and self-help interventions.

In the meta-analysis by Cuijpers et al., (2014), a subgroup analysis demonstrated no significant difference in overall effect size between the two groups of studies (adults of working age $g = 0.88$, older adults $g = 0.63$). However, insufficient information was provided as data was not disaggregated enough to derive an estimate of the differential efficacy of different types of psychotherapies between adults of working age and older people.

An earlier meta-analysis conducted by Covin, Ouimet, Seeds, and Dozois (2008) has addressed the efficacy of CBT for GAD between adults of working age and older people. Their findings indicated that adults of working age appear to benefit more from CBT than do older clients (young adults $ES = 1.69$, older people $ES = .82$). The main limitation of this study is relatively small numbers of studies included for calculating overall effect size for each group (adults of working age studies $n = 3$, older adults studies $n = 4$) which limits conclusions that can be reached and subgroup analyses that can be conducted. Small sample size was partly due to narrow inclusion criteria employed in the study (e.g., only studies that have used the Penn State Worry Questionnaire were included in the analyses). In addition, the literature search for the meta-analysis by Covin et al. (2008) covered articles only up to 2006 and thus more recent studies have not been included.

Thus, there remains a need to establish accurate and relevant indices of effect sizes for CBT for GAD between adults of working age and older people. Unless this question is addressed using a more robust methodological approach, i.e in a single meta-analysis comparing across age groups, it is difficult to reach a definitive conclusion on this important issue. This is important as previous conclusions about differential levels of efficacy may have discouraged clinicians from providing therapy options to older people and this is regrettable as many older people face significant barriers to accessing psychological therapy (Laidlaw, 2013). Reaching a more valid conclusion based on a more appropriate comparison metric will also help direct focus on the important clinical task of understanding what may explain the apparent difference in efficacy between age groups and suggest treatment alterations that may better meet the psychological needs of older people.

The aim of the current study is to conduct an up-to-date meta-analysis and compare the efficacy of CBT for GAD between adults of working age and older people. In order to reduce the heterogeneity of included studies and to obtain an empirically derived index of

CBT efficacy for GAD, the current study included RCTs that 1) used a treatment condition that belongs to the family of cognitive behavioral therapies (e.g., standard CBT, cognitive therapy, acceptance and commitment therapy, metacognitive therapy), 2) employed face-to-face delivery of individual or group therapy provided by qualified or adequately trained therapists, and 3) utilized non-active control conditions (e.g., placebo pill, waiting list) or psychological placebo conditions that control for nonspecific therapeutic factors (e.g., discussion group) as comparators.

The second aim of this meta-analysis is to identify potential factors that may be improved to enhance treatment outcomes in older people. Diagnosing and treating GAD in older people can often be challenging for therapists inexperienced in working with older people for a number of reasons. For example, older clients with GAD tend to worry about aging and their health, which is different from worry content expressed by adults of working age (Gorenstein, Papp, & Kleber, 1999). When these worry symptoms related to their health or aging are presented with some medical illnesses, which is often the case with older clients with common mental disorders, this can complicate detection and diagnosis.

The current review includes a qualitative content analysis of treatment protocols used in studies with older clients to identify components specifically designed for older people and explore potential factors that may be addressed in the future protocols to enhance treatment outcomes. To that end, we hypothesize an example of CBT model for GAD in later life that is age and developmentally appropriate and may enhance therapist understanding of the presentation of anxiety disorders in older people.

Methods

Identification and Selection of Studies

Literature search. Several approaches were used to identify studies. First, the SCOPUS, PsycINFO, and MEDLINE databases were searched for English language studies in January 2015. The search term *random** was used to identify randomized controlled studies. In order to include studies targeting generalized anxiety disorder the following terms were used: *GAD* OR *"Generalized Anxiety Disorder"* OR *"Generalised Anxiety Disorder"*. The following terms were used to identify studies that included a psychological treatment condition consisted of cognitive and/or behavioral elements: [*CBT* OR *Cognitive behavior* therap** OR *cognitive therap** OR *behavior* therap**] OR [*RBT* OR *Rational Behavior* Therap**] OR [*MCT* OR *meta-cognitive therap**] OR [*AMT* OR *"Anxiety Management Training"*] OR [*PST OR Problem solving therap**] OR [*ACT OR Acceptance and Commitment Therap**] OR [*Mindfulness* OR *MBSR* OR *MBCT*]. These searches produced 978 articles. The abstracts of 583 were examined after removing duplicate publications.

Second, the OpenGrey (http://www.opengrey.eu/search/), the ISRCTN registry (www.controlled-trials.com), the National Institutes of Health Clinical Trials Database (www.clinicaltrials.gov) were searched for information on unpublished trials or trials recently completed in February 2015. Three trials were identified, and the principal investigator of these trials were contacted for further details. We received a response from one of the principal investigators explaining that there are no outcome data available at this point.

Finally, manual searches in the reference lists of individual empirical trial papers, meta-analyses and evidence-based reviews of CBT were also completed in order to detect any potential missing references.

Exclusion and inclusion criteria. To be included in the meta-analysis, studies had to meet the following criteria:

1. Participants had to be over 18 years old and met DSM/ICD criteria for GAD as determined by a psychometrically sound and structured diagnostic instrument.

Participants had to have a primary diagnosis of GAD. Studies with participants of different types of anxiety disorders were excluded unless data were available for GAD participants only.

2. To be included in the adults of working age group all participants in the study needed to be aged between 18 and 60. To be included in the older adults group all participants needed to be above the age of 55. When participants' age range was not reported, we contacted the first author of the study for further details. Studies were excluded if further information was not available.

3. Participants had to be randomly assigned to either a treatment condition or a non-active control condition (e.g., placebo pill, treatment as usual). When a psychological placebo was used, the intervention had to be utilized to control for nonspecific therapeutic factors (e.g., discussions of the psychological problems). Studies were excluded if a psychological treatment control was used as a comparator (e.g., studies that compared CBT with psychodynamic psychotherapy). A list of 16 studies excluded due to the lack of an appropriate non-active comparator in the final stage of screening (see Figure 1) can be found in the Appendices.

4. Treatment condition was either CBT or an intervention composed of cognitive and/or behavioral principles. The Intervention had to adhere to a cognitive and/or behavioral protocol based around standard evidence-based CBT treatments for GAD as defined by the National Institute for Health and Care Excellence (NICE) or the American Psychological Association Guidelines.

5. Psychological interventions had to be delivered face to face by adequately trained clinicians according to a suitable evidence-based protocol.

6. The clinical severity of GAD had to be assessed using a psychometrically sound self-report measure. Studies had to report pre- and immediately post-therapeutic results.

We chose the Penn State Worry Questionnaire (PSWQ) as the primary outcome measure since the pervasiveness, excessiveness, and uncontrollable nature of worry is one of the key diagnostic features of GAD. Other measures of anxiety (e.g., Beck Anxiety Inventory, State-Trait Anxiety Inventory) were chosen as the main outcome measure for studies that did not use the PSWQ.

Studies Included

The first author (NK) screened the abstracts of all publications obtained through the search strategy, of which the full text of 62 were reviewed further for relevance. Applying the inclusion criteria resulted in the identification of 15 studies. The list of selected articles was checked by the second author (KL). Participants' age range was between 18 and 65 in eight studies. One study (Roemer, Orsillo, & Salters-Pedneault, 2008) included one participant at the age of 67. However, data provided by the primary author confirmed that all remaining participants were under 57. Eight studies were categorized as RCT for adults of working age. Seven studies were identified as RCT with older people. Of the seven articles with older people identified, six studies included participants aged 60 and over and two studies included participants aged 55 and over.

Coding

Two authors (NK, KL) read a random set of five papers from the final dataset and independently completed an electronic data extraction sheet in order to ensure accurate coding of studies selected for analysis. Following this pilot-testing, data for each included study were extracted independently by the first author (NK) and a research assistant who was independent of the study. The percentage of agreement for all study characteristics between the first author and the research assistant was 98.6%.

For each included study, information was recorded on (a) participants' age range and mean age; (b) the type of treatment condition (e.g., CBT); (c) the type of control condition

(e.g., treatment as usual, waiting list); (d) format of the therapy (i.e., individual or group); (e) the number of sessions; (f) the primary outcome measure (e.g., PSWQ); (g) the type of analyses (i.e., intention-to-treat, completers only); and (h) means, standard deviations, and sample size for the primary outcome measure in each condition at pre- and post-test (immediately after treatment). In addition, for RCT studies with older adults, we extracted the following information in order to conduct a content analysis of interventions used: (a) the professional background of therapists; and (b) components of CBT intervention and details of modifications made to the treatment manual to meet the need of older people.

Study Quality

Studies were also rated on the Randomized Controlled Trial Psychotherapy Quality Rating Scale (RCT-PQRS; Kocsis et al., 2010). This scale assesses the methodological quality of randomized controlled trial studies. The scale contains 25 items, which are grouped into six domains: description of subjects, definition and delivery of treatment, outcome measures, data analysis, treatment assignment, and overall quality of a study. The current meta-analysis focuses on pre- and immediately post-therapeutic results and thus Item 14 which assess the quality of long-term post-termination outcome was excluded.

Two authors (NK, KL) evaluated the methodological quality of five papers from the final dataset in order to ensure accurate understanding of the rating process and to agree procedure prior to independent checking between the first author (NK) and the research assistant. The Kappa result can be interpreted as follows: values ≤ 0 as indicating no agreement and 0.01–0.20 as none to slight, 0.21–0.40 as fair, 0.41–0.60 as moderate, 0.61–0.80 as substantial, and 0.81–1.00 as almost perfect agreement (Landis & Koch, 1977). For the current study, overall agreement on the RCT-PQRS items across two raters was substantial ($k = .68$).

Analyses

All data were analyzed using Comprehensive Meta-Analysis software (Borenstein & Rothstein, 1999). The effect size for the difference between CBT and control conditions were calculated for each included study using the Hedge's *g*. A pooled mean effect size was calculated for both groups of studies (adults of working age and older adults). As indicators of heterogeneity, the *Q*-statistic and the I^2-statstic were calculated.

An estimate of the effect size after publication biases was calculated using the Duval & Tweedie trim-and-fill approach that allows imputation of missing studies. The Rosenthal's Fail-safe N was used to compute the number of missing studies needed to be retrieved and incorporated in the analysis to reduce the overall effect size to a non-significant level. If only a few studies are required to nullify the observed effect, then there would be concern that the observed overall effect may not be robust.

Results

Characteristics of the Included Studies

A combined search conducted in January 2015 produced 586 titles and abstracts. 525 studies were excluded by reading abstracts due to clear irrelevance of the present research question. The remaining 46 studies were eliminated after reviewing the full-text article. Figure 1 presents a flow diagram illustrating the study selection process. Characteristics of the studies included in the meta-analysis are presented in Table 1 and 2.

Twelve CBT conditions were identified from eight studies categorized as RCTs for adults of working age (AWA studies). Ten CBT conditions were identified from seven studies categorized as RCTs with older people (OP studies). A total of 447 adults of working age with GAD participated in AWA studies (Treatment *n* = 273, Control *n* = 174) and 323 older people with GAD participated in OP studies (Treatment *n* = 176, Control *n* = 147).

The age range of participants for AWA studies was 18-65 years with a mean age of 39.7 (*SD* = 5.50). Participants for OP studies were all 55 years old or above. The mean age of participants was 67.7 (*SD* = 1.46).

The attrition rates in treatment conditions varied from 5.3% to 37.5% for AWA studies (mean attrition rate of 16.6%) while the attrition rates for OP studies ranged from 7.1% to 30.8% (mean attrition rate of 17.5%). When looking at the number of studies reporting attrition of less than 15%, more AWA studies meet this criteria (67% of AWA studies had less than 15% attrition) whereas 40% of the OP studies achieved attrition rates of 15% or less for treatment conditions. Attrition rates in the control conditions varied from 0% to 50% for AWA studies (mean attrition rate of 13.3%) while attrition rates for OP studies ranged from 0% to 35% (mean attrition rate of 21.4%). Although there was one study with a high dropout rate (50%), the majority of AWA studies report relatively low attrition rates for control conditions (0-25%). The attrition rates in control conditions were consistently higher across OP studies compared to AWA studies, 75% of the AWA studies reported attrition rates of less than 15% whereas only 37.5% of the OP reported attrition at less than 15%.

There were some differences between the interventions used in the two groups of studies. The majority of the AWA studies used traditional CBT techniques to treat individuals with GAD (*n* = 10). The remaining two AWA studies used a relatively new form of CBT (i.e., acceptance and commitment therapy and metacognitive therapy), while all OP studies used traditional CBT approaches. There were no notable differences in format of the therapy used. Most treatment conditions in both groups of studies used individual format rather than group (see Table 1 and 2).

The most used control condition in AWA studies was a waiting list condition (*n* = 10). The other two studies used a nonspecific psychological approach such as active listening as a control condition. By contrast, only half of the OP studies used a waiting list condition (*n*

= 5). Three studies used regular telephone calls to provide support and ensure patient safety (e.g., suicidal ideation) during the waiting period. The remaining two OP studies used a nonspecific psychological approach (nondirective supportive therapy and discussion groups) as a control condition.

There were also some differences between the outcome measures used in AWA and OP studies. The majority of OP studies used PSWQ to demonstrate the treatment outcome in individuals with GAD (PSWQ $n = 8$, others $n = 2$), while only half of the AWA studies used PSWQ (PSWQ $n = 6$, others $n = 6$). For those AWA and OP studies that used the PSWQ as the primary outcome measure, there were no statistically significant differences between levels of worry symptoms assessed by PSWQ at baseline (t (26) = .73, ns).

There were also some important differences between the methods used for data analysis involving primary outcome measure in the two groups of studies. Half of the AWA studies used intent-to-treat analysis (ITT) with primary outcome measure (ITT analysis $n = 6$, completer analysis $n = 6$). All OP studies used completer analysis to demonstrate the effects of intervention ($n = 10$).

The possible range of the total score of study quality rating (i.e., RCT-PQRS) is 0-46. The total score of study quality for RCTs for adults of working age ranged 25-38 with none of the studies being rated below 23. The score of 23 corresponds to an average score of 1 (scale of 0–2) on each individual item of the RCT-PQRS. By contrast, the total score of RCTs with older people ranged 18-37. Two studies scored 23 or below indicating the possibility of poor quality in some of the methodologies used in those two studies (e.g., poor reporting of adherence to treatment, inadequate therapist supervision, small sample size, and/or inadequate use of outcome measure).

Overall Mean Effect Sizes of Studies in Adults of Working Age and Older People

Effect sizes varied considerably, from moderately negative ($g = -0.50$) to very large and positive ($g = 4.23$) for AWA studies (Figure 3). The random effect model showed an overall effect size of $g = 0.94$ (95% CI = 0.52-1.36). This indicates a significantly large effect of CBT on GAD with adults of working age ($Z = 4.41$, $p <.000$). There was statistically significant high heterogeneity between study effect sizes (Q (11) = 52.61, $p <.000$; $I^2 =$ 79.09).

Figure 4 presents summary data for effect sizes derived from OP studies. Effect sizes varied considerably, from not effective ($g = 0.02$) to large and positive ($g = 2.23$). The random effect model showed an overall effect size of $g = 0.55$ (95% CI = 0.22-0.88), indicating a significant medium effect of CBT on GAD with older people ($Z = 3.25$, $p <.001$). There was statistically significant moderate heterogeneity between study effect sizes (Q (9) = 17.38, $p <.043$; $I^2 = 48.25$).

Although AWA studies demonstrated larger effect size compared to OP studies, this difference failed to reach statistical significance (Q (1) = 2.13, $p =.144$). However, note that, in our analysis, studies that had more than one comparison between CBT and a control group were included. The inclusion of multiple comparisons from one study in the same analysis may have resulted in an artificial reduction of heterogeneity for studies with both adults of working age and older people.

Publication Bias

AWA studies. The Duval & Tweedie trim-and-fill approach suggested that one study was potentially missing; if imputed, the overall effect size would increase to $g = 1.06$ (95% CI = 0.62-1.49). Rosenthal's Fail-safe N analysis suggested that 267 failed trials is required for the combined two-tailed p-value to exceed .05, suggesting that the observed effect sizes are likely to be robust.

OP studies. The Duval & Tweedie trim-and-fill approach suggested that one study was potentially missing. When this imputed study is included, the overall effect size would drop to $g = 0.46$ (95% CI = 0.09-0.84). Rosenthal's Fail-safe N approach suggested there would need to be 52 failed trials before the combined two-tailed p-value to exceed .05. In comparison to AWA studies, fewer studies are required for the overall effect size to reach a non-significant level, suggesting that the observed effect sizes for OP studies may not be robust.

Content Analysis of Interventions to Promote CBT Outcomes in Older People

Table 3 presents the professional background of therapists, components of CBT intervention, and details of modifications made to the treatment manual based on the needs of older people for OP studies. One study (Mohlman et al., 2003) used different treatment protocols for study 1 and 2. Thus, eight CBT protocols were identified from seven studies categorized as OP studies.

Of those eight CBT protocols, four used traditional CBT manuals standardized for general use (Borkove & Costello, 1993; Craske, Barlow, & O'Leary, 1992). There were no modifications made to traditional CBT manuals in two studies (Stanley, Beck, & Glassco, 1996; Stanley et al., 2003a). The remaining two used traditional CBT manuals with some procedural modifications such as the use of mnemonic aids and examples more relevant to older people, simplifying homework forms and terminology used, and omitting elements such as time management and benzodiazepine withdrawal (Stanley et al., 2003b; Wetherell, Gatz, & Craske, 2003). However, there was no clear rationale provided for why these adaptations were made.

Four OP studies used CBT manuals specifically designed for the use with older people. Of those four studies, one study by Stanley et al. (2009) used the manual developed by Stanley, Diefenbach, and Hopko (2004). The manual adopted by these studies is relatively

similar to the protocols described above where some procedural modifications were adopted to enhance applicability with older people. The main differences from the traditional CBT manual emphasize procedural rather than conceptual adaptations such as the use of mnemonic aids and simplifying homework forms and terminology used. In addition to these procedural modifications, this protocol developed by Stanley et al. (2004) also employs motivational interviewing technique (e.g., reviewing the reasons why the patient came for help in the first place and facilitating a discussion of the pros and cons of change) along with traditional CBT techniques (i.e., progressive muscle relaxation, cognitive therapy, exposure treatment, problem-solving, and sleep-management).

Of the remaining three protocols employed by Mohlman et al. (2003) and Mohlman and Gorman (2005) these researchers used the manual developed by Gorenstein et al. (1999). This manual includes traditional CBT techniques such as progressive muscle relaxation, cognitive therapy, exposure treatment, problem-solving, and sleep-management. In addition, the manual introduces some techniques derived from the clinical experience of Gorenstein and his team working with older clients with anxious symptoms.

For example, one of the approaches used in the Gorenstein manual is the use of worry behavior prevention and exposure to worrisome situations focused on worries about aging and health. Another example of the adaptations is the use of daily structure exercises to inhibit worry by providing a competing focus. According to the manual, this is due to the fact that although younger adults can also suffer from generalized anxiety, their worrying is to some extent curbed while engaging in these alternative activities (e.g., raising children), and the option to increase these activities can be exercised while there may be few such alternative activities readily available among older clients (Gorenstein et al., 1999). Furthermore, Mohlman et al. (2003) and Mohlman and Gorman (2005) have made some

procedural modifications to this original manual such as the use of learning and memory aids to increase homework compliance and strengthen memory for techniques (see table 3).

The background of therapists in OP studies varied from the graduate student level to the postdoctoral and residency-level clinicians. A total of 24 therapists involved in OP psychotherapy studies. The majority of therapists ($n = 19$) had some experience in CBT but only four had experience of working with older people.

Discussion

The primary aim of the current study was to conduct a meta-analysis to compare the efficacy of CBT for GAD between adults of working age and older people. Although there were no statistically significant differences in the effect size of CBT between the two age groups, the overall effect size of CBT outcomes for older clients was moderate while CBT for adults of working age demonstrated a large effect, suggesting that there is still room for improvement in CBT with older people. In addition, publication bias was evident in studies with older adults indicating that the effect size for studies with older people may not be robust. This is mainly due to a relatively small number of studies that focused on CBT with older people and as such, the evidence here needs to be interpreted with caution.

The magnitude of the difference in the overall effect sizes of two groups was larger than the difference demonstrated in a recent comprehensive meta-analysis examining the efficacy of psychological treatments for GAD (Cuijpers et al., 2014). A major difference between the data reported here is the sole focus on CBT interventions in the two groups (AWA vs OP). Unlike the paper by Cuijpers et al. (2014) where the aim was to evaluate the efficacy of psychological therapies for GAD, the primary aim of this current study is to examine whether there is a difference in outcome based on age of participants. As such our

data differs from that of Cuijpers et al. (2014), as one might expect, because the sampling frames differ.

The findings also demonstrated several important differences between the set of studies with adults of working age and older people. Two studies from adults of working age group (Roemer et al., 2008; van der Heidena, Murisb, & van der Molen, 2012) used a relatively new form of CBT, acceptance and commitment therapy and metacognitive therapy, to treat individuals with GAD with a former study (Roemer et al., 2008) demonstrating the largest effect size among all included studies ($g = 4.23$). Although there is preliminary evidence that these recently developed new forms of CBT are effective and acceptable among older clients (e.g., Karlin et al., 2013; Wetherell et al., 2011), studies exploring the efficacy of CBT for older people with GAD remain focused on traditional CBT approaches.

Another notable difference was that none of the studies with older people had used ITT analysis to demonstrate the effects of intervention. In the ITT analysis all randomized individuals are included in the analysis regardless of whether or not they completed treatment. This approach reflects real-life situations wherein not every client fully adheres to their treatment (i.e., more realistic estimate of the outcome) and not following the ITT principle risks introducing selection bias (White, Carpenter, & Horton, 2012). In relation to this, the results of methodological quality rating indicated the possibility of poor quality in some of the studies with older clients such as poor reporting of adherence to treatment and small sample size.

More studies are needed to evaluate the efficacy of CBT as well as other interventions that falls within the family of CBT for GAD in older people. Furthermore, future RCTs with older clients should focus on improving the quality of methodology and statistical reporting to provide better evidence to inform decision making in treatment with older clients.

Another goal of this meta-analysis was to conduct a qualitative content analysis of treatment protocols used in studies with older clients to identify components specifically designed for older people and explore potential factors that may be addressed in the future protocols to enhance treatment outcomes.

The content analysis of treatment demonstrated that the majority of protocols used standard CBT or standard CBT with some procedural modifications such as the use of mnemonic aids and examples more relevant to older people, and simplifying homework forms and terminology used. Although these modifications are primarily procedural and appear to be sensible in improving the therapeutic alliance and enhancing access to treatment engagement, the data reported here suggests such modifications add little to improving treatment outcome.

While we are not arguing against some judicious use of sensible and individualized modifications that enhances accessibility of treatment for older people, we are arguing that an approach taking account of relevant theories on normal aging to derive a new set of interventions (e.g. wisdom enhancement in CBT) is a more efficacious and efficient approach for augmenting treatment outcome. Sadavoy (2009) has outlined five reasons that working with older people may be different from that of adults of working age and as such CBT may be qualitatively different in application with older people. Researchers such as Scheibe and Carstensen (2010) and Knight, Karel, Hinrichsen, Qualls, and Duffy (2009) argue that older people have different psychological needs and different emotional developmental trajectories and as such therapy modifications should take these into account. Simply put as older people are a different development stage of life and may be facing different challenges in maintaining wellbeing (e.g., changes in health status, roles, relationships etc.) in comparison to adults of working age, treatment needs to reflect this.

Future Directions

A recent review by Laidlaw and Kishita (2015) and a clinical textbook (Laidlaw, 2015) propose the application of gerontological theories in CBT as "vehicles for change" in order to augment treatment outcome. Gerontology is the science of understanding normal aging. It is a multidisciplinary science exploring the physical, cognitive, emotional, and social changes associated with the process of aging and ways of managing such age-related changes. The main theories examining adaptation to aging share a common focus in exploring how people adopt self-regulatory approaches to maintain optimal functioning (See Heckhausen, Wrosch, & Schulz, 2010). The integrative model by Heckhausen et al. (2010) suggests that there are two adaptive control mechanisms that people can exercise. Primary control is where one exerts control over one's environment and secondary control is where one adapts oneself in order to function better in one's environment. In older people with anxiety disorders and comorbid physical illness such as Stroke or COPD, this theory provides a rationale for the incorporation of selection, optimization with compensation (Freund, 2008) into CBT to enhance problem-solving interventions. In CBT for late life anxiety disorders, Heckhausen's theory suggests clients and therapists ought to focus attention and efforts upon enhancing secondary control processes in order to achieve a more efficacious outcome for therapy. As such this validates gerontological research as having high value for therapists working with older people.

More generally, gerontological theories may be useful to CBT therapists because knowledge of research on normal aspects of aging can act as a counterbalance when working with clients who are not aging normally, such as people wth anxiety disorders. Interestingly and perhaps tellingly in terms of overall outcome, the current meta-analysis demonstrates only very a small number of therapists in the older people GAD outcome studies had previous experience in geropsychology practice. It appears that researchers preferentially focused on CBT skills and knowledge but largely ignored information about aging. This

appears surprising as it suggests that the researchers believe that aging and experience of

clients is largely irrelevant in treatment protocols with this population. This may well be the

case with 'younger' older people recruited in the main in the studies entered into the analysis

here, but given that people are living longer than previous generations therapists are likely to

work with people who may be 4 or 5 decades older than them and with levels of complexity,

comorbidity, and chronicity of a level that demands therapists adopt a developmentally

appropriate frame of reference (Knight et al., 2009).

Adopting theories from gerontology into therapy can help therapists challenge clients'

expectations for change as it encourages a focus on the normative experience of aging which

are not necessarily about anxiety or loss. For example, in anxiety disorders in CBT there is a

cognitive negativity bias towards threat-cues (Joorman & Tanovic, 2015; Ouimet,

Gawronski, & Dozois, 2009). Carstensen and colleagues (Carstensen et al., 2011; Mather &

Carstensen, 2005; Scheibe & Carstensen, 2010) have shown from their research that older

people have a positivity bias for recall —that is, older people tend to demonstrate a

preference for positive over negative information in attention and memory. This evidence can

challenge therapists who lack an understanding that the majority of older people do not

experience aging as an especially distressing time of life. However, this positivity appears to

be eradicated when older people experience anxiety symptoms (e.g., Lee & Knight, 2009;

Price, Siegle, & Mohlman, 2012) and as such a negative bias for recall seen among older

clients is non-normative and hence dysfunctional (*and* treatable).

As another example of the relevant application of gerontology to the treatment of

anxiety disorders in later life, Levy (2009) proposes that as members of an ageist society we

all possess a biased view of aging characterized by a negative stereotype promoting a view

of aging as being about loss and decrepitude that can become a self-fulfilling prophesy.

Stereotype embodiment theory (Levy, 2009) suggests prolonged exposure to ageist societal

attitudes reinforced from childhood through to adulthood result in people developing an internalized negative aging self-stereotypes which is maintained and reinforced by attentional biases toward negative information about aging. As one ages one might envisage that the future may be perceived with dread for what aging may bring the individual. Clients with a pre-existing history of anxiety disorders may fear aging especially in an overgeneralized and unhelpful way (e.g. looming vulnerability model of anxiety: Ruskind & Williams, 2006) and unless the negative stereotype for aging is considered within a formulation and raised as a focus for intervention, treatment outcome may be lessened. Therefore, such negative attitudes to aging need to be challenged in CBT in same way that all negative cognitions are even though those age-related cognitions may seem realistic or 'understandable'.

Furthermore, others theories from gerontology such as selective optimization with compensation (SOC: Freund, 2008) and wisdom (Baltes & Smith, 2008) may be useful in developing new interventions within CBT. Further details are beyond the scope of this review, and can be found elsewhere (Laidlaw, 2015; Laidlaw & Kishita, 2015). The application of gerontological theories may guide thinking in designing age-appropriate studies of CBT for GAD with older people and especially for clients whose symptomatology may be better apprehended with respect to challenges of aging either currently experienced or feared as a consequence of further aging. Future studies that compare the efficacy of standard CBT and age-appropriate augmented CBT may be informative as regards development of effective interventions for late-life anxiety and depression.

Limitations and Recommendations

Caution in the interpretation of findings from the current study are recommended. Despite adopting a robust approach in conducting a meta-analysis by employing relatively stringent inclusion and exclusion criteria nevertheless all the CBT studies that examined GAD in older people were based on completer analyses rather than adopting a more optimal

ITT design. In general, effect sizes are higher in completer analyses. As such there is an argument to make that the efficacy of CBT for older people with GAD is likely overestimated compared with the efficacy of CBT for working age adults in the current meta-analysis. A further conclusion about limitation would suggest that there is an urgent need to design a treatment trial of CBT for GAD in later life that adopts an ITT approach in order to ascertain magnitude of efficacy that may be possible.

Another limitation of this current meta-analysis is the use of non-active psychological controls such as nondirective supportive psychotherapy as comparators, which may have yielded a highly heterogeneous group of control conditions. Nondirective supportive psychotherapy used in Stanley et al. (1996) focused on nondirective group discussion of anxiety symptoms. Participants were allowed to discuss coping skills as they wished during group sessions, but no specific skills were taught, and therapists did not provide differential reinforcement for any particular mode of coping. Thus an approach such as this that controlled for nonspecific therapeutic factors (e.g., therapist-client contact time) was categorized as a psychological placebo in the current meta-analysis. An additional analysis was conducted to calculate effect sizes excluding three studies that used psychological controls (i.e., Linden et al., 2005, Stanley et al., 1996, and Wetherell et al., 2003). This increased the overall effect size in the both age groups (AWA $g = 0.93$, OP $g = 0.70$). The overall effect size of CBT outcomes for adults of working age remained large while CBT for older adults demonstrated a moderate to large effect, still suggesting that there is room for improvement when compared with younger adults.

In addition, the review has a narrow focus on GAD only and does not examine CBT efficacy for anxiety disorders in general. This focus was chosen on the basis of pragmatics as many studies evaluating CBT for anxiety disorders with older people report GAD samples.

The current available evidence would not permit a refined enough subgroup analysis to answer questions about efficacy for different anxiety disorders in older adults.

The final major limitation here is that there is overlap between the two age groups, as the adults of working age studies typically recruit participants up to the age of 65 and the older people studies included in this review all recruited participants from age 60 onwards. Thus there may not be clear age differences being examined here. This point again suggests an important flaw in the current data pertaining to CBT for late life anxiety disorders as we do not have studies that reflect contemporary demographic profiles of societies in which the studies are being applied. Thus there is an urgent need to redress this gap in knowledge. What is required is a study of GAD that evaluates CBT with a participant group that would represent the age profile that clinicians working with older people are typically likely to meet (e.g., clients in their 80s are no longer uncommon). Thus a study that recruits older people aged 65 years onwards with no upper age limit and an intention to have equal numbers of oldest-old participants (i.e., 65-74 and 75+) is recommended.

Conclusion

The current study has demonstrated that CBT for GAD with older people is as efficacious as with adults of working age. The main difference in outcome between CBT for GAD between the two age groups is related to methodological quality in that no older people study used an ITT design, whereas the majority of studies conducted with adults of working age did. It is also evident when looking at the age range for the studies with 'older people' that there is overlap with age between the studies as some participants in the older people clinical trials were recruited at age 55 years. Given the current demographic projections there is a real need for studies targeting participants who more reflect the increasing age at which people are seen in clinical settings (i.e., one of us in our routine clinical practice regularly

works with clients well into their 80s). The older people studies were conducted according to

robust CBT protocols but did not take account of evidence about normal aging to modify

treatment approaches and to ensure interventions were age-appropriate. We propose the

application of gerontological theories in CBT as this can be useful in alerting clinicians to

consider contextual factors when engaging in therapy with older clients and to consider new

age-appropriate CBT interventions.

Based on our conclusions calling into question methodological approaches that

preferentially focus on CBT skills to the relative exclusion of training in geriatrics and

gerontology, we propose that a new research agenda needs to be developed to address this

gap between key parameters between adults of working age and older people studies.

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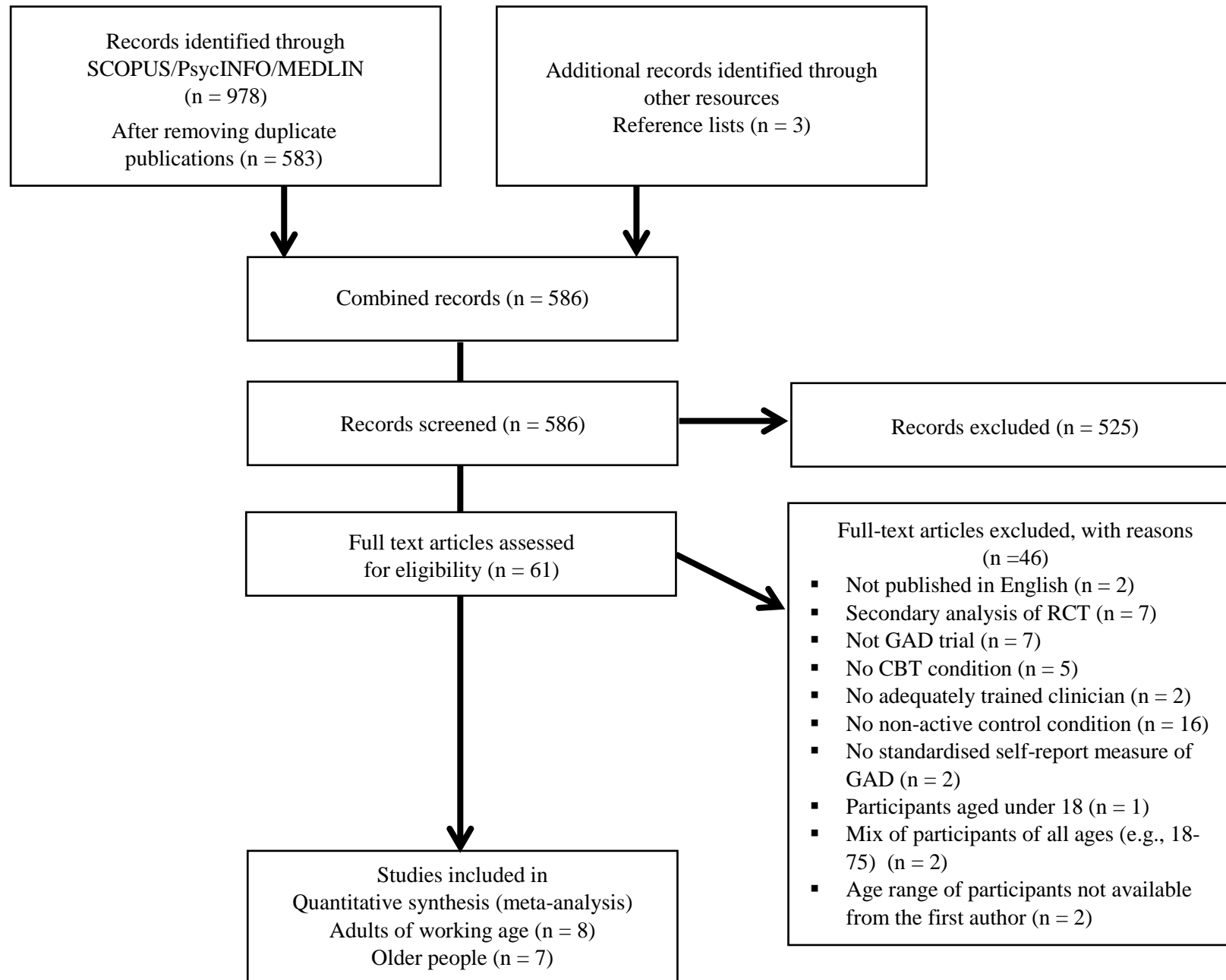
Figure 1. Flow chart of the selection of studies of CBT for the treatment of generalized anxiety disorders.

Study name	Statistics for each study							Hedges's g and 95% CI
	Hedges's g	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	
Barlow, 1992 (1)	0.694	0.442	0.195	-0.173	1.560	1.569	0.117	
Barlow, 1992 (2)	-0.500	0.412	0.170	-1.308	0.307	-1.214	0.225	
Barlow, 1992 (3)	0.112	0.420	0.176	-0.711	0.935	0.267	0.789	
Butler, 1991 (1)	1.246	0.348	0.121	0.563	1.929	3.578	0.000	
Butler, 1991 (2)	0.442	0.326	0.106	-0.197	1.081	1.356	0.175	
Dugas, 2003	1.056	0.292	0.085	0.483	1.629	3.613	0.000	
Dugas, 2010 (1)	0.836	0.317	0.100	0.216	1.457	2.642	0.008	
Dugas, 2010 (2)	1.233	0.328	0.108	0.590	1.877	3.757	0.000	
Gosselin, 2006	1.168	0.294	0.086	0.593	1.743	3.980	0.000	
Linden, 2005	0.464	0.236	0.056	0.001	0.928	1.965	0.049	
Roemer, 2008	4.226	0.641	0.411	2.970	5.482	6.595	0.000	
van der Heiden, 2012	1.285	0.280	0.078	0.737	1.833	4.593	0.000	
	0.943	0.214	0.046	0.524	1.363	4.409	0.000	

-4.00   -2.00   0.00   2.00   4.00

Control   CBT

Figure 2. Effect sizes (Hedge's g) derived from studies examining the effects of CBT compared to a control group in adults of working age

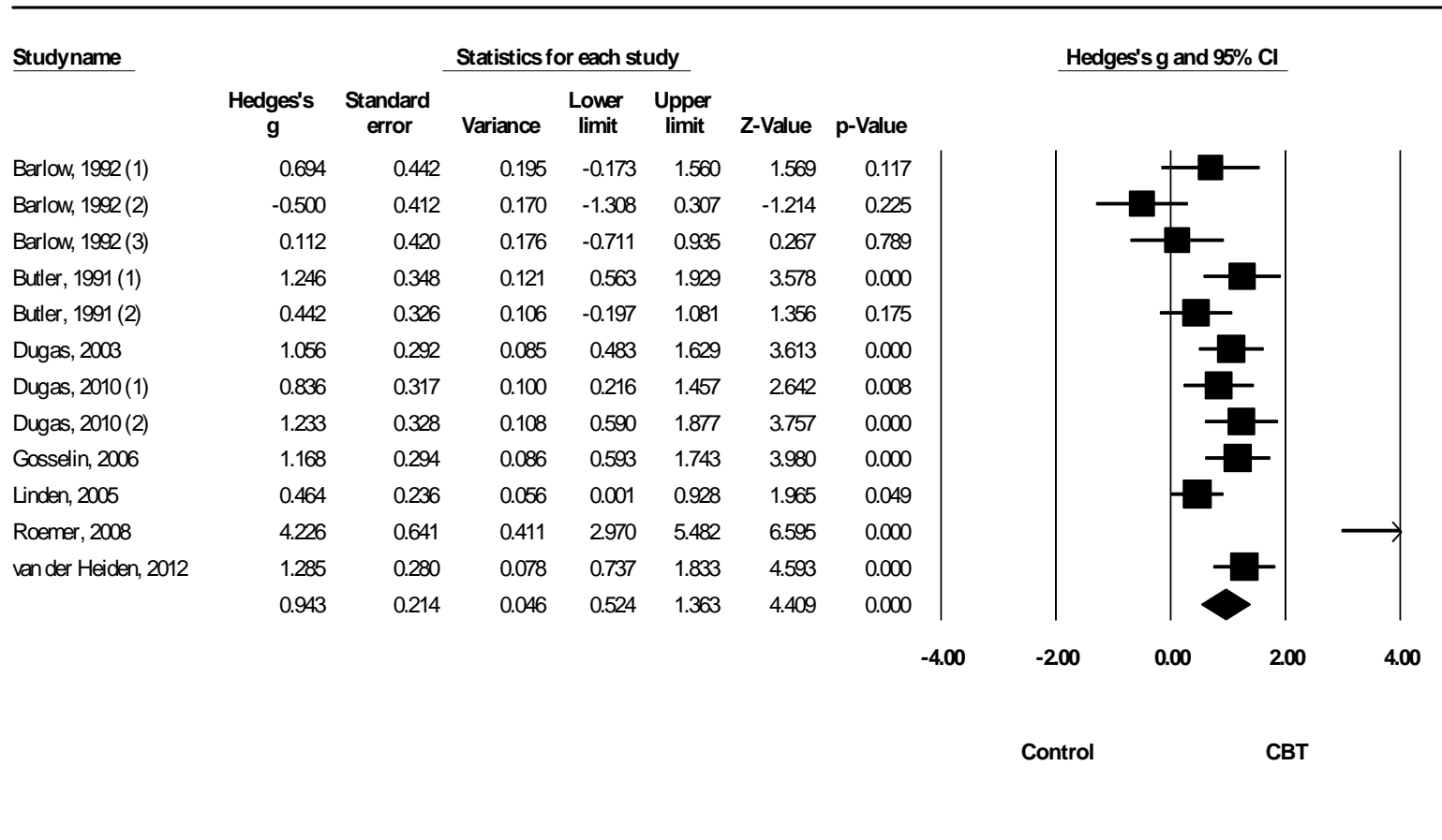| Study name	Statistics for each study							Hedges's g and 95% CI
	Hedges's g	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	
Mohlman, 2003 (1)	0.017	0.419	0.176	-0.805	0.839	0.041	0.967	
Mohlman, 2003 (2)	0.561	0.498	0.248	-0.415	1.536	1.127	0.260	
Mohlman, 2005 (1)	0.963	0.455	0.207	0.072	1.854	2.119	0.034	
Mohlman, 2005 (2)	2.228	0.657	0.431	0.941	3.516	3.393	0.001	
Mohlman, 2005 (3)	0.191	0.469	0.220	-0.728	1.110	0.408	0.683	
Stanley, 1996	0.145	0.355	0.126	-0.551	0.841	0.409	0.683	
Stanley,Beck, 2003	0.739	0.257	0.066	0.236	1.242	2.881	0.004	
Stanley, Hopko, 2003	1.864	0.741	0.549	0.413	3.316	2.517	0.012	
Stanley, 2009	0.462	0.189	0.036	0.091	0.833	2.441	0.015	
Wetherell, 2003	0.000	0.326	0.106	-0.639	0.639	0.000	1.000	
	0.546	0.168	0.028	0.216	0.875	3.246	0.001	

-4.00   -2.00   0.00   2.00   4.00
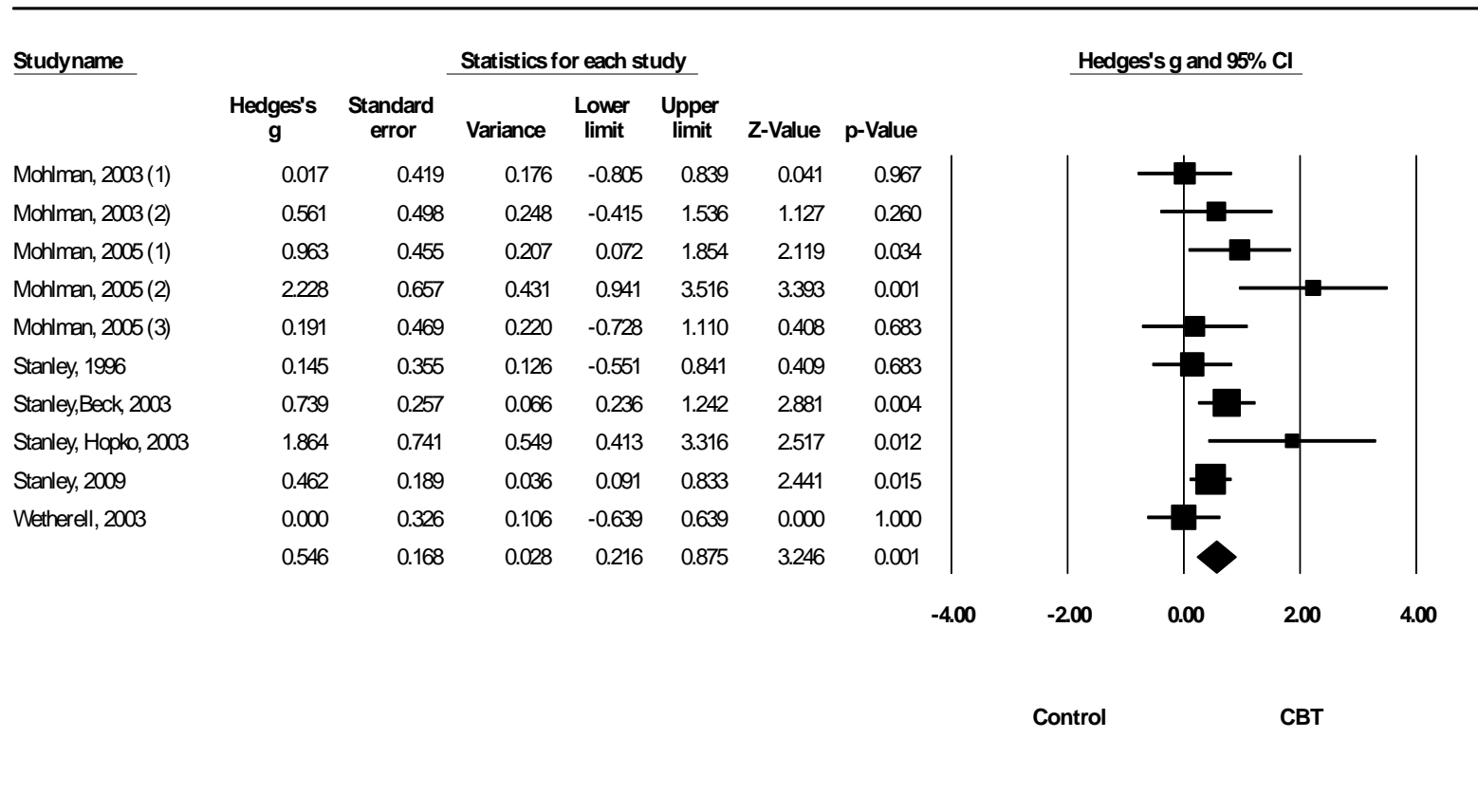
Control   CBT

Figure 3. Effect sizes (Hedge's g) derived from studies examining the effects of CBT compared to a control group in older people

Table 1. Selected characteristics of studies examining the effects of CBT compared to control groups in adults of working age

Study First-named author	Age range (*Mean*) [b]	CBT type	*n* at post test	Format	No. of sessions	Control type	*n* at post test	Pre-test PSWQ [e] - CBT - Control	Analyses	Study quality (0-46)
Barlow, 1992 (1) [a]	18-65 (40.7)	AR	10	Individual	15	Waitlist [c]	10	NA	Completer	28
Barlow, 1992 (2)	-	COG	13	Individual	15	-	-	NA	Completer	-
Barlow, 1992 (3)	-	AR + COG	11	Individual	15	-	-	NA	Completer	-
Butler, 1991 (1) [a]	18-65 (35.0)	CBT	19	Individual	12	Waitlist [d]	19	NA	Completer	28
Butler, 1991 (2)	-	BT	18	Individual	12	-	-	NA	Completer	-
Dugas, 2003	21-59 (41.2)	CBT	25	Group	14	Waitlist	27	High High	ITT	30
Dugas, 2010 (1) [a]	18-64 (38.5)	AR	22	Individual	12	Waitlist [d]	20	Moderate Moderate	ITT	35
Dugas, 2010 (2)	-	CBT	23	Individual	12	-	-	High Moderate	ITT	-
Gosselin, 2006	20-65 (50.3)	CBT with tapering	27	Individual	12	NST with tapering	26	High Moderate	Completer	38
Linden, 2005	18-65 (43.3)	CBT	36	Individual	25	Contact control	36	NA	ITT	35
Roemer, 2008	18-57 [c] (33.6)	ABBT	15	Individual	16	Waitlist	16	High High	ITT	25
van der Heiden, 2012	18-65 (35.0)	MCT	54	Individual	14	Waitlist	20	High High	ITT [f]	33

a) The number in brackets represents different treatment conditions within the study (e.g., a study employing CBT and Enhanced CBT treatment conditions).

b) The age range and the mean for the whole sample.

c) This study included one participant at the age of 67. All remaining participants were under 57.

d) The same waiting list condition was used for analyse across all CBT conditions.

e) PSWQ: High worry = 60-80, Moderate worry = 40-59, Low worry = 16-39 (Meyer et al., 1990).

f) This study reported both ITT and completer analyses. ITT data was used to calculate the effect size.

ABBT = acceptance-based behaviour therapy; AR = applied progressive muscle relaxation; BT = behaviour therapy; CBT = cognitive behaviour therapy; COG = cognitive restructuring; ITT = intent-to-treat analysis MCT = metacognitive therapy; NST = nonspecific psychological treatment control condition; PSWQ = Penn State Worry Questionnaire.

Table 2. Selected characteristics of studies examining the effects of CBT compared to control groups in older people

Study First-named author	Age range (*Mean*) [b]	CBT type	*n* at post test	Format	No. of sessions	Control type	*n* at post test	Pre-test PSWQ [f] - CBT - Control		Analyses	Study quality (0-46)
Mohlman, 2003 (1) [a]	60-74 (66.4)	CBT	11	Individual	13 [c]	Waitlist	10	NA		Completer	23
Mohlman, 2003 (2)	60-79 (67.5)	Enhanced CBT	8	Individual	13 [c]	Waitlist	7	NA		Completer	-
Mohlman, 2005 (1) [a]	60-78 (68.8)	CBT Intact EF	10	Individual	13	Waitlist [e]	10	High	High	Completer	29
Mohlman, 2005 (2)	-	CBT Improved EF	5	Individual	13	-	-	High	High	Completer	-
Mohlman, 2005 (3)	-	CBT Exec Dys	7	Individual	13	-	-	High	High	Completer	-
Stanley, 1996	55-81 (68.3)	CBT	18	Group	14	Nondirective SP	13	Moderate	High	Completer	30
Stanley, Beck, 2003	60+ (66.2)	CBT	29	Group	15	Weekly phone calls	35	High	High	Completer	34
Stanley, Hopko, 2003	62-79 (70.6)	CBT	5	Individual	8 [d]	Weekly phone calls	4	High	Moderate	Completer	18
Stanley, 2009	60+ (66.9)	CBT	65	Individual	10	Biweekly phone calls	50	Moderate	Moderate	Completer	37
Wetherell, 2003	55+ (67.1)	CBT	18	Group	12	Discussion Group	18	High	High	Completer	34

a) The number in brackets represents different treatment conditions within the study (e.g., a study employing CBT and Enhanced CBT treatment conditions).

b) The age range and the mean for the whole sample.

c) Participants attended monthly booster sessions for 6 consecutive months. Participants completed a posttreatment assessment immediately after the 13-week treatment or wait period.

d) Two additional sessions were allowed for patients experiencing immediate crises or needing additional time to learn coping skills.

e) The same waiting list condition was used for analyse across all CBT conditions.

f) PSWQ: High worry = 60-80, Moderate worry = 40-59, Low worry = 16-39 (Meyer et al., 1990).

CBT = cognitive behaviour therapy; CBT Intact EF = This CBT condition included individuals with intact executive functioning at both pre- and post-treatment; CBT Improved EF = This CBT condition included individuals with low executive scores at pre-test but intact at post-treatment; CBT Exec Dys = This CBT condition included individuals with low executive scores at pre- and post-treatment; PSWQ = Penn State Worry Questionnaire; SP = supportive therapy.

Table 3. Therapist characteristics and CBT components for RCTs with older people

Study First-named author	Therapists	Therapist Background		CBT manual	Traditional CBT components	Components added to meet the need of older people
		CBT experience	Working with OP			
Mohlman, 2003 (1)	2 doctoral-level clinicians	Y	-	CBT manual for OP (Gorenstein et al, 1999)	▪ Progressive muscle relaxation ▪ Exposure treatment ▪ Cognitive therapy ▪ Problem-solving ▪ Sleep-management	1) Focusing on worries about ageing and health related matters - Worry behaviour prevention - Exposure to worrisome situations 2) Addressing reduced structure of daily life in older people - Daily structure exercises to inhibit worry by providing a competing focus
Mohlman, 2003 (2)	2 doctoral-level clinicians	Y	-	CBT manual for OP (Gorenstein et al, 1999) + addition of learning and memory aids	▪ Progressive muscle relaxation ▪ Exposure treatment ▪ Cognitive therapy ▪ Problem-solving ▪ Sleep-management	1) Focusing on worries about ageing and health related matters - Worry behaviour prevention - Exposure to worrisome situations 2) Addressing reduced structure of daily life in older people - Daily structure exercises to inhibit worry by providing a competing focus 3) Learning and memory aids designed to a) increase homework compliance; b) strengthen memory for techniques; and c) facilitate the use of techniques.
Mohlman, 2005	2 doctoral-level clinicians	Y	-	CBT manual for OP (Gorenstein et al, 1999) + addition of learning and memory aids (Mohlman et al., 2003)	▪ Progressive muscle relaxation ▪ Exposure treatment ▪ Cognitive therapy ▪ Problem-solving ▪ Sleep-management	1) Focusing on worries about ageing and health related matters - Worry behaviour prevention - Exposure to worrisome situations 2) Addressing reduced structure of daily life in older people - Daily structure exercises to inhibit worry by providing a competing focus 3) Learning and memory aids designed to a) increase homework compliance; b) strengthen memory for techniques; and c) facilitate the use of techniques.
Stanley, 1996	3 graduate students 1 graduate student	Y - [a)]	- -	Traditional CBT manuals (Borkove & Costello, 1993; Craske et al., 1992)	▪ Progressive muscle relaxation ▪ Cognitive therapy ▪ Exposure treatment	NA

Stanley, Beck, 2003	4 postdoc psychology fellows 1 psychology graduate	Y Y	- -	Traditional CBT manuals (Borkove & Costello, 1993; Craske et al., 1992) used in Stanley et al. 1996	▪ Progressive muscle relaxation ▪ Cognitive therapy ▪ Exposure treatment	NA
Stanley, Hopko, 2003	Postdoc- and residency-level clinicians	-	-	Traditional CBT manuals (Borkove & Costello, 1993; Craske et al., 1992) used in Stanley, Beck, et al. 2003 Wetherell et al. 2003	▪ Progressive muscle relaxation ▪ Cognitive therapy ▪ Exposure treatment ▪ Problem-solving ▪ Sleep-management	1) Many treatment procedures (e.g., mnemonic aids, terminology used) and homework forms were simplified.
Stanley, 2009	3 masters'-level therapist 1 predoctoral intern 1 post-bachelor's level therapist	Y Y Y	- - Y [b]	CBT manual for OP (Stanley et al., 2004)	▪ Motivational interviewing ▪ Progressive muscle relaxation ▪ Cognitive therapy ▪ Exposure treatment ▪ Problem-solving ▪ Sleep-management	1) Many treatment procedures (e.g., mnemonic aids, terminology used) and homework forms were simplified.
Wetherell, 2003	4 clinical psychology trainees	-	Y [c]	Traditional CBT manual (Craske et al., 1992)	▪ Progressive muscle relaxation ▪ Cognitive therapy ▪ Exposure treatment	1) Elements such as time management and benzodiazepine withdrawal were omitted. 2) Examples were made more relevant to older people.

a) One therapist had expertise in supportive psychotherapy.

b) One post-bachelor's level therapist had 5 years' experience in CBT for late-life anxiety

c) Three therapists had specialised training in therapy with older adults.

CBT = cognitive behaviour therapy; OP = older people.

Appendix A. A list of 16 studies excluded due to the lack of an appropriate non-active comparator

Study First-named author	Treatment group(s)	Control group(s)	Further reason(s) for exclusion
Arntz,2003	CT	Applied Relaxation	
Biswas, 1995	CBT	Biofeedback Pharmacotherapy	
Bond, 2002	Anxiety management training + Pharmacotherapy	NDT + Pharmacotherapy NDT + Placebo	The NDT involved acknowledging feelings and using open questions to encourage further communication. No detailed descriptions for "further communication" were provided in the article.
Borkovec, 1993	CBT	Applied Relaxation NDT	The NDT involved facilitating acceptance of affective experience. As daily homework for use in subsequent sessions, clients were also asked to keep a written journal to elaborate on observations about the day's events, their thoughts, feelings, images, anything that they did differently, what effect those changes had, and insights about their reactions.
Crits-Christoph, 2011	CBT + Pharmacotherapy	Pharmacotherapy	
Dugas, 2009	CBT	Applied Relaxation	
Durham, 1994	CT	Brief psychoanalytically-based psychotherapy Anxiety management training	
Hayes-Skelton, 2013	ABBT	Applied Relaxation	
Hoge, 2013	MBSR	Stress Management Education	
Koszycki, 2010	CBT	Multifaith spiritually based intervention (SBI)	The SBI involved teaching psychological skills such as mindfulness and self-acceptance to manage difficult emotions.
Leichsenring, 2009	CBT	Psychodynamic Psychotherapy	
Öst, 2000	CT	Applied Relaxation	
Wells, 2010	MCT	Applied Relaxation	
Wetherell, 2013	CBT + Pharmacotherapy	Pharmacotherapy	
Zargar, 2013	ABBT	Applied Relaxation	
Zhang, 2002	CT + Chinese Taoist Philosophy (CTCP) CTCP + Pharmacotherapy	Pharmacotherapy	

ABBT = acceptance-based behaviour therapy; CBT = cognitive behaviour therapy; CT = cognitive therapy; MBSR = mindfulness-based stress reduction; MCT = metacognitive therapy; NDT = Non-directive therapy

Appendix B. Reference list of 16 studies excluded due to the lack of an appropriate non-active comparator

Arntz, A. (2003). Cognitive therapy versus applied relaxation as treatment of generalized anxiety disorder. *Behaviour Research and Therapy*, 41(6), 633–646. http://dx.doi.org/10.1016/S0005-7967(02)00045-1

Biswas, A., Biswas, D., & Chattopadhyay, P. K. (1995). Cognitive behaviour therapy in generalised anxiety disorder. *Indian Journal of Clinical Psychology*, 22, 1–10.

Bond, A. J., Wingrove, J., Valerie Curran, H., & Lader, M. H. (2002). Treatment of generalised anxiety disorder with a short course of psychological therapy, combined with buspirone or placebo. *Journal of Affective Disorders*, 72(3), 267–271. http://dx.doi.org/10.1016/S0165-0327(01)00469-4

Borkovec, T. D., & Costello, E. (1993). Efficacy of applied relaxation and cognitive–behavioral therapy in the treatment of generalized anxiety disorder. *Journal of Consulting and Clinical Psychology*, 61(4), 611–619. http://dx.doi.org/10.1037/0022-006X.61.4.611

Crits-Christoph, P., Newman, M. G., Rickels, K., Gallop, R., Gibbons, M. B. C., Hamilton, J. L., Ring-Kurtz, S., & Pastva, A. M. (2011). Combined medication and cognitive therapy for generalized anxiety disorder. *Journal of Anxiety Disorders*, 25(8), 1087–1094. http://dx.doi.org/10.1016/j.janxdis.2011.07.007

Dugas, M. J., Francis, K., & Bouchard, S. (2009). Cognitive behavioural therapy and applied relaxation for generalized anxiety disorder: A time series analysis of change in worry and somatic anxiety. *Cognitive Behaviour Therapy*, 38(1), 29–41. doi: 10.1080/16506070902980745

Durham, R. C., Murphy, T., Allan, T., Richard, K., Treliving, L. R., & Fenton, G. W. (1994). Cognitive therapy, analytic psychotherapy and anxiety management training for generalised anxiety disorder. *British Journal of Psychiatry*, 165(3), 315–323. DOI: 10.1192/bjp.165.3.315

Hayes-Skelton, S. A., Roemer, L., & Orsillo, S. M. (2013). A randomized clinical trial comparing an acceptance-based behavior therapy to applied relaxation for generalized anxiety disorder. *Journal of Consulting and Clinical Psychology*, 81(5), 761–773. doi: 10.1037/a0032871

Hoge, E. A., Bui, E., Marques, L., Metcalf, C. A., Morris, L. K., Robinaugh, D. J., Worthington, J. J., Pollack, M. H., & Simon, N. M. (2013). Randomized controlled trial of mindfulness meditation for generalized anxiety disorder: Effects on anxiety and stress reactivity. *Journal of Clinical Psychiatry*, 74(8). 786–792. doi: 10.4088/JCP.12m08083

Koszycki, D., Raab, K., Aldosary, F., & Bradwejn, J. (2010). A multifaith spiritually based intervention for generalized anxiety disorder: a pilot randomized trial. *Journal of Clinical Psychology*, 66, 430–441. doi:10.1002/jclp.20663

Leichsenring, F., Salzer, S., Jaeger, U., Kächele, H., Kreische, R., Leweke, F., Rüger, U., Winkelbach, C., & Leibing, E. (2009). Short-term psychodynamic psychotherapy and cognitive-behavioral therapy in generalized anxiety disorder: A randomized, controlled trial. *American Journal of Psychiatry*, 166(8), 875–881. doi: 10.1176/appi.ajp.2009.09030441

Öst, L.-G., & Breitholtz, E. (2000). Applied relaxation vs. cognitive therapy in the treatment of generalized anxiety disorder. *Behaviour Research and Therapy*, 38(8), 777–790. http://dx.doi.org/10.1016/S0005-7967(99)00095-9

Wells, A., Welford, M., King, P., Papageorgiou, C., Wisely, J., Mendel, E. (2010). A pilot randomized trial of metacognitive therapy vs applied relaxation in the treatment of adults with generalized anxiety disorder. *Behaviour Research and Therapy*, 48(5), 429–434. http://dx.doi.org/10.1016/j.brat.2009.11.013

Wetherell, J. L., Petkus, A. J., White, K. S., Nguyen, H., Kornblith, S., Andreescu, C., Zisook, S., Lenze, E. J. (2013). Antidepressant medication augmented with cognitive-behavioral therapy for generalized anxiety disorder in older adults. *American Journal of Psychiatry*, 170(7), 782–789. doi: 10.1176/appi.ajp.2013.12081104

Zargar, F., Farid, A. A. A., Atef-Vahid, M.-K., Afshar, H., & Omidi, A. (2013). Comparing the effectiveness of acceptance-based behavior therapy and applied relaxation on acceptance of internal experiences, engagement in valued actions and quality of life in generalized anxiety disorder. *Journal of Research in Medical Sciences : The Official Journal of Isfahan University of Medical Sciences*, 18(2), 118–122.

Zhang, Y., Young, D., Lee, S., Zhang, H., Xiao, Z., Hao, W., Feng, Y., Zhou, H., & Chang, D. F. (2002). Chinese Taoist cognitive psychotherapy in the treatment of generalized anxiety disorder in contemporary China. *Transcultural Psychiatry*, 39(1), 115–129. doi: 10.1177/136346150203900105