# Group-based Relaxation Response Skills Training for pharmacologicallyresistant depressed and anxious patients

Roberto Truzoli<sup>1</sup>, Cecilia Rovetta<sup>1</sup>, Caterina Viganò<sup>1</sup>, Paola Marianna Marinaccio<sup>1</sup>, Gabriella Ba<sup>1</sup>, & Phil Reed<sup>2</sup>

<sup>1</sup>Università degli Studi di Milano, Italy; <sup>2</sup>Swansea University, UK

Correspondence Address: Phil Reed,

Department of Psychology,

Swansea University,

Singleton Park,

Swansea, SA2 8PP, UK.

Tel.: 0044 (0)1792 602047.

Fax.: 0044 (0)1792 295679.

E-mail: p.reed@swansea.ac.uk

Short Title: Relaxation response training.

Pre print: Behavioural and Cognitive Psychotherapy, 2017, 45, 2, 193-197 DOI:

https://doi.org/10.1017/S1352465816000400

# Abstract

**Background:** Drug-resistance for depression and anxiety is a major limitation in the treatment of these common disorders, and adjunct support interventions may be beneficial in the treatment of these patients.

**Aims:** The purpose of this study was to evaluate the effects of a short-term (8 session) Relaxation Response Skills Training (RRST) programme for a population of psychiatric outpatients with anxiety and mood disorders who were unresponsive to drug treatment, and to test the feasibility of this intervention as complementary treatment for a psychiatric setting.

**Methods**: Forty patients were measured for overall psychopathological symptoms, depression, and anxiety, and were then given an 8-week course of RRST, while continuing their pharmacological treatment. Following the RRST intervention, participants were again assessed.

**Results**: The results demonstrated reductions in overall symptoms (large effect size and reasonable clinically significant change), and also in depression and anxiety (medium effect sizes and clinically significant change).

Conclusions: These results suggest that this short-term RRT offers a simple and costeffective way to augment drug management for participants with common psychiatric disorders who are less responsive to the drug treatment.

**Key words**: relaxation training, depression, anxiety, drug resistance.

Anxiety and Mood Disorders are among the most prevalent psychiatric conditions that require treatment (Mathers & Loncar, 2006; Merikangas et al., 2010), and the associated problems are the most relevant of the symptoms that lead to referral to psychiatric units (Costello et al., 2011). Psychopharmacological treatment is highly common for these patients (Hollingworth, Burgess, & Whiteford, 2010), but this approach has been noted to have a variable set of outcomes (Fournier et al., 2010; Pigott et al., 2010; Trivedi et al., 2006). In particular, there are individuals who, for a variety of reasons, such as noncompliance (Mahler et al., 2010) or drug-resistance (Scelzo et al., 2011), do not respond to pharmacological regimes for depression and anxiety disorders (Cukor et al., 2009). Such non-responsiveness is suggested to be as a high as 66% in terms of failure to fully respond to drug treatment, and around 50% in terms of only partial reduction of depressive symptoms (Trivedi et al., 2006). Given the prevalence of anxiety and depression, and the degree to which many patients exhibit drug resistance, developing cost-effective effective psychological interventions, either as an alternative or complement to pharmacological treatment, is a clear need for publicallyfunded psychiatric services (Kocsis et al., 2009; Wiles et al., 2013).

There are many well-tested and well-documented psychological interventions for depression and anxiety, such as Cognitive Behaviour Therapy (CBT; Wiles et al., 2013) and Acceptance and Commitment Therapy (Hayes, Strosahl, & Wilson, 2012). These types of programme have had demonstrable impact on the symptoms reported by individuals with depression and anxiety (Coull & Morris, 2011; Cuijpers et al., 2013). Moreover, there is evidence that CBT can provide some degree of benefit if used as a complementary support for pharmacological treatment in drug-resistant patients (Wiles et al., 2013). However, this beneficial effect of adjunct psychological support is by no means universally found, with some reports failing to note any benefit of psychological treatment to drug-resistant patients over and above altered pharmacological regimes (Kocsis et al., 2009), and some reports

suggesting that patients will respond to either to pharmacological or to psychological interventions when they presented separately (Schatzberg et al., 2005).

In addition to this mixed pattern of results, a further drawback to the implementation of programmes, such as CBT in publically-funded healthcare systems is their typical one-toone delivery, and the consequent relative financial expense and shortage of trained professionals (Gunter & Whittal, 2010). For example, in one report (Wiles et al., 2013), drug-resistant individuals required between 6 to 18 sessions of individual CBT (each session lasting 50-60 minutes), in addition to their usual pharmacological care from their medical practitioner. The relative cost of such an intensive treatment may prove somewhat restrictive in terms of offering this precise form of adjunct psychological support for drug-resistant patients. In fact, it has been noted that there is no greater benefit from a full CBT approach relative to a brief supportive psychotherapy programme, with individual session being much shorter (Kocsis et al., 2009).

There are, however, a range of psychosocial treatments whose characteristics may overcome some of the financial drawbacks of full CBT programmes, and which could be investigated as complementary interventions in medical and mental health settings. For example, and the use of relaxation-based approaches has grown over the last twenty years (Lee et al., 2007), and these approaches can easily be applied in group settings which may prove more cost-effective (Dickson-Spillmann et al., 2012; McGillivray & Evert, 2014; Turner, 1982). Moreover, outcome-effectiveness evidence has demonstrated such relaxationbased approaches to have some efficaciousness across a range of clinical conditions, including anxiety (Borkovec & Costello, 1993) and depression (Jorm, Morgan, & Hetrick, 2008; McGillivray & Evert, 2014).

One such intervention strategy is the Relaxation Response Skills Training (RRST) programme, which has been employed for the treatment of a broad set of clinical conditions

that take stress as common factor and focus of the treatment (Benson, Beary, & Carol, 1974). RRST is a self-regulatory integrated approach to stress reduction and emotion management that includes relaxation training, cognitive restructuring, mindfulness, and meditative techniques. As this procedure can be applied easily in a group setting (Truzoli et al., 2011), it was thought worthwhile to document its impact on outcomes of depressed and anxious patients who had displayed drug-resistance. The RRST procedure is a multi-factorial intervention (Benson et al., 1974), based on an integration of psychological and meditative approaches to both change and acceptance, sharing much in common with other relaxation based approaches (Borkovec & Costello, 1993; Jorm et al., 2008). Several studies have indicated the potential effectiveness of the RRST programme for disorders such as hypertension (Benson, Alexander, & Feldman, 1975; McConville, Dusek, & Dusek, 2012), and obsessive compulsive disorder (Twohig et al., 2010), but there have been few investigations for the most commonly occurring problems such as depression and anxiety.

Given this, the current study aimed to investigate the efficacy of a group-based RRST approach for a homogeneous set (anxiety and depression) of drug-resistant patients. Benchmarking studies (McEvoy & Nathan, 2007) concerning the effectiveness of groupbased CBT approaches for heterogeneous clinical groups have demonstrated that: there is a wide effect-size range of 0.5 to 3.5, with a mean of about 1.0; about 30% of participants achieve reliable change, and 10% achieve clinically significant change. These figures may be somewhat higher than those that are typically seen for drug resistant patients offered CBT, who show effect sizes of around .7 (Wiles et al., 2013). A further point of note taken up by the current study is that most of these efficacy studies have used patient self-report measures of depression and anxiety (e.g., Beck's Depression and Anxiety Inventories), and the current study also employed clinician-rated measures of these problems (i.e., the Hamilton Scales).

# Method

#### **Participants**

A sample of 40 patients (11 male and 29 female) who were consecutively referred to a psychiatric unit in a teaching hospital a large Italian city were studied. The patients had a mean age of 48.50 ( $\pm$  13.15; range = 19 – 69) years old: males = 50.27 ( $\pm$  14.46; range = 24 – 69); females = 47.83 + 12.82; range = 19 - 69).

All patients had a diagnoses, made by a Psychiatrist independent to this study using the DSM-IV-TR, of either an anxiety (N = 16; 3 male; 13 female; mean age = 49.31 + 14.86, range = 19 - 69) – 14 Generalized Anxiety Disorder, 1 Adjustment Disorder, 1 Anxiety Disorder No Specification; or depressive disorder (N = 24; 8 male; 16 female; mean age = 47.96 + 12.12, range = 26 - 69) – 16 Anxious Depressive Syndrome, 5 Major Depressive Recurrent, 1 Dysthymic Disorder, 1 Bipolar Disorder II, 1 Bipolar disorder No Other Specification. All psychiatric diagnoses were made through psychiatric interview, without the use of psychiatric tests. The study excluded any patients referred with Axis II comorbidities.

The patients had been referred to the Psychology unit by their Psychiatrist as they were only partially responsive to pharmacological treatment (21 had been treated with an SSRI; and 19 with an SNRI). The inclusion criteria were that patients: (i) showed only a small improvement (between 20% and 50%) on the Hamilton Depression Scale and the Hamilton Anxiety Rating Scale; (ii) had no symptom reduction or remission over 75% to 100% of the Hamilton Scales; (iii) had the same level of symptoms for greater than 6 months; (iv) had received at least two cycles of drug treatment with an adequate duration and dosage for each treatment as indicated by current guidelines; and (v) had been receiving the pharmacological treatment for a mean of three months prior to their referral to the Psychiatric outpatients unit. The judgment of partial responsiveness was based on previous guidelines

(Kennedy et al., 2009), and consistent with the guidelines of the U.K. National Institute for Health Care Excellence (NICE, 2009; 2013).

#### **Materials**

Symptom Checklist 90 (SCL-90; Derogatis, 1992) is a 90-item self-report instrument evaluating a range of psychopathological symptoms: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. The sum of the items produces the Global Severity Index (GSI) for overall psychological distress with an internal reliability (Cronbach  $\alpha$ ) of .97 (Prinz et al., 2013). Factor analytic studies of the Italian version have suggested use of the GSI is most optimal as a measure of symptom distress (Prunas et al., 2012). A clinical cut-off point of a T-score of 63 is suggested for the overall scale (Derogatis, 1992), which corresponds to the 90<sup>th</sup> percentile for the appropriate nonclinical population. Non-clinical Italian populations have been found to have a mean overall score of 36 (DiMaggio et al., 2011), suggesting a clinical cut-off of 73.

Hamilton Depression and Anxiety Scales (HAMD; Hamilton, 1960, & HAMA, Hamilton, 1969) the HAMD is a 21-item clinician-administered questionnaire that indicates depression. Scores of 8 or higher indicate depression, and a non-clinical Italian sample has been found to have a mean of 3.5 (Scimeca et al., 2014). The scale has an internal reliability (Cronbach  $\alpha$ ) of between 0.97 (Bagby et al., 2004).

The HAMA is a 14-item clinician-administered questionnaire indicating anxiety. Scores of 8 or higher indicate anxiety (Bjelland et al., 2002), and a non-clinical Italian sample has been found to have a mean of 3.6 (Scimeca et al., 2014). The scale has an internal reliability ( $\alpha$ ) of between .96 (Bruss et al., 1994).

**Beck Depression Inventory** (BDI; Beck et al., 1961) is a 21-item self-report questionnaire that assesses the clinical symptoms of depression over the past week. The score is a sum of the positive answers, ranging from 0 to 63, and it is suggested that scores of 14 or greater reflect the presence of depression. Non-clinical Italian samples have been found to score 10.5 (DiMaggio et al., 2014). The internal reliability ( $\alpha$ ) of the scale is .92 (Beck et al., 1988).

Spielberger Trait Anxiety Inventory (STAI-T; Spielberger, 1983) rates the affective, cognitive, and physiological manifestations of anxiety in terms of long-standing patterns (i.e., trait anxiety). Scores for each question range from 1 = never, to 4 = almost always, and the total score can range from 20 to 80. A score of greater than 45 is recommended as showing signs of anxiety. Non-clinical Italian samples have been found to score 43 on the STAI (DiMaggio et al., 2014). The internal reliability (α) of the scale is .93 (Spielberger, 1983).

#### **Intervention**

The programme was modelled after, but not affiliated with, the clinical programmes of the Benson-Henry Institute for Mind Body Medicine at Massachusetts General Hospital. Patients were taught a variety of techniques aimed at helping with their psychological symptoms and as a self-regulatory integrated approach to stress reduction and emotion management including: relaxation (Relaxation Response); cognitive restructuring techniques; and mindfulness and meditative techniques.

The training was delivered in 8-weekly, 2-hour group sessions (with a 10-min break in the middle); with a one-hour intake individual assessment session, and a one-hour posttreatment individual assessment session. Each session was run by two co-therapists: a psychologist and a psychiatrist. In each session, the time was split approximately evenly between didactic education and discussion and practice of the targeted skills.

During Session 1, the participants were taught about the concepts of stress, coping, and the role of breathing in helping reduce stress. After the break there was a focus on diafragmatic breathing, and a debriefing about the contents of the session. In Session 2, there was a focus on the psychophysiology of stress and relaxation, followed by an introduction to a number of relaxation exercises. In Session 3, there was an introduction to the psychophysiology of emotions, followed by instruction and training in a mindfulness exercise (typically focused breathing). In Session 4, there were life-style and physical activity assessment, followed by the introduction of a meditation exercise. In Session 5, there were lessons on life style and nutrition, followed by a contemplation exercise. Session 6 included a stress and cognitive structuring exercises, followed by further instruction and practice of relation exercises. Session 7 focused on resilience and protective factors related to anxiety and depression, followed by a relaxation exercise. Finally, Session 8 dealt with resources about relapse prevention and further relaxation exercises.

## Procedure

On referral to the unit the patients were all given information relating to the programme and study, and gave their informed consent to participate in accordance with the Ethical Approval given by the hosting hospital. During the first individual assessment session (prior to the group sessions commencing), the patients were all given a battery of psychological tests, including the SCL-90, HAMD, HAMA, BDI, and STAI. They then participated in the eight-week RRST programme, as detailed above, receiving one 2-hour group-based RRST session a week for 8 weeks. Following completion of the intervention, the patients were again given the tests during the final assessment session and were debriefed regarding the study.

# Results

#### Table 1

All patients completed the programme (i.e. attended all of the sessions). Table 1 shows the mean numbers of symptoms (SCL-90), depression scores (BDI and Hamilton), and anxiety scores (STAI and Hamilton), for the sample pre- and post-intervention, and the mean change (post-treatment minus pre-treatment scores) across the programme. Table 1 also shows the significance of this change assessed by a paired t-test, and the effect size (d) for this value.

Inspection of the pre-intervention scores shows that the mean number of symptoms was higher than the suggested clinical cut-off, as were the self-rated (BDI) and clinician-rated (HAMD) depression scores. Similarly, the mean self-rated (STAI) and clinician-rated (HAMA) anxiety scores were higher than the cut-off point for the presence of anxiety. After treatment, all scores had decreased below the respective cut-off points for moderate clinical severity. These reductions were statistically significant for all of the measures, with there being large effect-sized decreases according to established criteria<sup>50</sup> for the overall symptoms, and for clinician-rated depression and anxiety. Table 1 displays correlations between both age and gender and change scores. In no cases were the changes in the outcome variables significantly related to the potential predictors, all *ps>*.06.

#### Tables 2 and 3

The changes scores for patients with depressive (Table 2) or anxiety (Table 3) disorders show broadly similar patterns to that for the overall sample. There were slightly greater effect sizes for the impact of the treatment on participants with a depressive disorder (Table 2) compared to those with an anxiety (Table 3) disorder.

#### Table 4

Table 4 shows the percentage of participants in the overall sample, and also the percentage of participants with a depressive or anxiety disorder, showing improvement in symptoms following the intervention. Four measures of improvement were taken: the simple change in the raw score for the various scales; the statistically reliable change<sup>51</sup>; a change from above to below the published cut off for the scale for mild symptoms; and a change from above to below the level calculated to be clinically significant using a movement to the non-clinical side of the point halfway between 2 standard deviations away from the clinical mean and within two standard deviations of the non-clinical mean<sup>51</sup>. In calculating these values the sample mean was used along with the normative means for non-clinical Italian samples given above, and the reliability scores given above.

Inspection of these data shows that overall symptoms (SCL-90) improved for the majority of participants, but that this change was important (reliable or clinically-significant) in around 30 to 40% of patients. There was a greater impact on patients who were depressed than those who were anxious, with around 50% of depressed patients improving compared to around 25% of anxious patients. A greater proportion of patients noted self-reported clinically-significant recovery for depression (25-50%) than for anxiety (< 10%). However, when clinician-rated clinically-significant changes were assessed, around 50-60% showed clinically-significant improvement for anxiety compared to around 15% for depression.

In terms of symptoms of depression, the change was similar for depressed and anxious patients for self-reported symptoms, but was greater for depressed than for anxious patients in terms of clinician-rated symptoms. In terms of anxiety symptoms, a greater percentage of depressed patients showed important change compared to anxious patients – a trend which was more pronounced for the clinician-rated symptoms.

In order to determine if the treatment impacted on specific symptom types, the change in the subscales of the SCL-90 were examined. Figure 1 shows the mean change in the scores for the sub-scales of the SCL-90 for the sample overall, and for the patients with depressive or anxiety disorders. These scores represent the total for the sub-scale divided by the number of questions in that scale (i.e., they are the mean score per item). These change scores were analyzed using paired t-tests against zero change, while adopting a Bonferonni correct (0.05/9 = 0.0055) for significance. For the sample overall, Somatization, t(39)=5.35, p<.001 d=.85; Obsessive compulsive, t(39)=6.52, p<.001, d=1.03; Interpersonal Sensitivity, t(39)=5.06, p<.001, d=.80; Depression, t(39)=5.19, p<.001, d=.82; Anxiety, t(39)=6.02, p<.001, d=.95; and Paranoid Ideation, t(39=3.17, p<.003, d=.51, were all statistically reliable. For patients with depression the scales for: Somatization, t(23)=5.40, p<.001, d=1.10; Obsessive compulsive, t(23)=4.68, p<.001, d=.95; Interpersonal Sensitivity, t(23)=4.79, p<.001, d=.98; Depression, t(23)=4.65, p<.001, d=.95; Anxiety, t(23)=5.55, p<.001, d=1.13; and Phobic Anxiety, t(23)=3.08, p<.006, d=.63, were all statistically reliable. For patients with anxiety, only the change for Obsessive Compulsive symptoms, t(15)=4.50, p<.001, d=1.12, reached the corrected level of statistical significance.

## **Discussion**

The results demonstrated that the treatment had good patient acceptability, with none of the cohort dropping out of the treatment programme. This is a striking feature of the data, and it is unclear whether this aspect is specific to the therapists/setting employed here, or would generalise to other settings. There was a reduction in overall levels of symptoms measured by the SCL-90, and patients showed moderate improvement in their depression and anxiety. The effect sizes and the levels of reliable and clinically-significant change for this treatment are somewhat lower than those seen for group-based CBT for non-drug resistant

patients with a mixed set of symptoms (Nakao et al., 2001), but they are comparable with those data reported in previous studies of the impact of CBT on drug-resistant patients (Wiles et al., 2013); the moderate effect sizes of the current study were broadly similar to those seen in previous studies of psychological support for drug-resistant patients (Wiles et al., 2012). However, these improvements were the result of group-based rather than individual sessions, which may offer benefit in terms of cost-effectiveness, and also are in line with findings that suggest full CBT is not more effective than brief supporting psychotherapy (Kocsis et al., 2009).

The impact of the current RRST programme was greater for depression than for anxiety, which is also in line with previous investigations of the effect of group-based relaxation programmes (McGillivray & Evert, 2014). The reasons for this pattern of results require further exploration, but may include the social support offered to individuals in group sessions, which is known to help alleviate depressive symptoms (Cohen & Wills, 1985). There were some differences between the degree to which symptoms were shown to be improved according to clinician-rated and patient-rated scales. Although, the former tended to show greater effect sizes, it may be the latter which are ultimately more important in terms of client-rated success of the programme. The reasons for the discrepancies will likely include the slightly different foci of the questionnaires used by clinicians and patients, but may also include the degree to which particular symptoms may be regarded as important to the patents in their own functioning, and possible rater bias (and future studies may want to include a blind rater approach). However, that the patients did not some improvement in terms of the symptoms that they thought important is encouraging.

The current study was observational in nature, and inclusion of a comparison group is a future research goal. This would allow investigation of the non-specific effects of 16 hours of contact with therapists. However, the fact that the patients had not shown improvement

prior to their involvement in the RRST programme for a long period of time, suggests that it may be a useful adjunct to the pharmacological approach. The mechanism of action of the RRST is still unclear, in that the patients continued on their course of medication during the treatment. This leave open the possibilities that either the RRST programme was effective in its own right, or that it helped to produce greater adherence to the pharmacological regime. It should be noted that the programme is complex, and it might be that not all components are needed. That depression decreased more than anxiety is paradoxical given relaxation reduces arousal, and it may be that social support is a major active component of this procedure. Additionally, the results of the study could be developed by including the use of measurement of the target behaviours taught in the programme, inter-rater agreement on the clinician measures, and the addition of a longer-term follow up assessment.

That the RRST programme was successful with patients who had previously demonstrated little change in their symptomatology through the use of pharmacological interventions is encouraging, and adds to the number of psychological supports that may be considered for this patient group (Wiles et al., 2013). Thus, the current preliminary results suggest that this short-term RRST offers a simple and cost-effective way to augment management for the most common psychiatric disorders claimed in public health settings, as complementary intervention in case of patients less responsive to the drug treatment.

## References

- Bagby, R.M., Ryder, A.G., Schuller, D.R., & Marshall, M.B. (2004). The Hamilton Depression Rating Scale: has the gold standard become a lead weight? American Journal of Psychiatry, 161, 2163-2177.
- Beck, J.S. (2011). Cognitive behavior therapy: Basics and beyond. Guilford Press.
- Beck, A.T., Steer, R.A., & Garbin, M.G.J. (1988). Psychometric properties of the Beck Depression Inventory Twenty-five years of evaluation. Clin. Psych. *Review*, **8**, 77–100.
- Beck, A.T., Ward, C.H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. Archives of General Psychiatry, 4, 561-571.
- Benson, H., Alexander, S., & Feldman, C. (1975). Decreased premature ventricular contractions through use of the relaxation response in patients with stable ischaemic heart-disease. The Lancet, 306, 380-382.
- Benson, H., Beary, J.F., & Carol, M.P. (1974). The relaxation response. *Psychiatry:* Journal for the Study of Interpersonal Processes.
- Bjelland, I., Dahl, A.A., Haug, T.T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale: an updated literature review. Journal of Psychosomatic Research, **52(2)**, 69-77.
- 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.
- Bruss, G.S., Gruenberg, A.M., Goldstein, R.D., & Barber, J.P. (1994). Hamilton anxiety rating scale interview guide: joint interview and test retest methods for interrater reliability. Psychiatry Research, 53, 191–202.

- Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cohen, S., & Wills, TA. (1985). Stress, social support, and the buffering hypothesis. Psychological Bulletin, 98(2), 310.
- Costello, E.J., Egger, H.L., Copeland, W., Erkanli, A., & Angold, A. (2011). The developmental epidemiology of anxiety disorders: Phenomenology, prevalence, and comorbidity. Anxiety Disorders in Children and Adolescents: Research, Assessment and Intervention, 2011, 56-75.
- Coull, G., & Morris, P.G. (2011). The clinical effectiveness of CBT-based guided self-help interventions for anxiety and depressive disorders: a systematic review. Psychological Medicine, 41, 2239.
- Cuijpers, P. et al. (2013). A meta-analysis of Cognitive-Behavioural Therapy for adult depression, alone and in comparison with other treatments. Canadian *Journal of Psychiatry*, 58(7).
- Cukor, D. et al. (2009). Depression is an important contributor to low medication adherence in hemodialyzed patients and transplant recipients. *Kidney* International, 75, 1223-1229.
- Derogatis, L.R. (1992). SCL-90-R, administration, scoring and procedures manual-II for the Revised version and other instruments of the Psychopathology Rating Scale Series Clinical Psychometric Research.
- Dickson-Spillmann, M., Kraemer, T., Rust, K., & Schaub, M. (2012). Group hypnotherapy versus group relaxation for smoking cessation: an RCT study protocol. BMC Public Health, 12(1), 271.
- DiMaggio, G., Nicolò, G., Brüne, M., & Lysaker, P.H. (2011). Mental state understanding in adult psychiatric disorders: Impact on symptoms, social

- functioning and treatment. Psychiatry Research, 190(1), 275-293.
- Fournier et al. (2010). Antidepressant drug effects and depression severity. JAMA: *The Journal of the American Medical Association*, **303**, 47-53.
- Gunter, R.W., & Whittal, M.L. (2010). Dissemination of cognitive-behavioral treatments for anxiety disorders: Overcoming barriers and improving patient access. Clinical Psychology Review, 30, 194-202.
- Hamilton, M. (1960). A rating scale for depression. J Neurol Neurosurg Psychiatry, **23**, 56–62.
- Hamilton, M. (1969). Diagnosis and rating of anxiety. Br J Psychiatry 1969; **3(special issue)**: 76-79.
- Hayes, S.C., Strosahl, K., & Wilson, K.G. (2012). Acceptance and commitment therapy. Guilford Press.
- Hollingworth, S.A., Burgess, P.M., & Whiteford, H.A. (2010). Affective and anxiety disorders: prevalence, treatment and antidepressant medication use. Australian and New Zealand Journal of Psychiatry, 44, 513-519.
- Jacobson, N.S., Follette, W.C., & Revenstorf, D. (1984). Psychotherapy outcome research: methods for reporting variability and evaluating clinical significance. *Behavior Therapy*, **15**, 336-352.
- Jorm, A.F., Morgan, A.J., & Hetrick, S.E. (2008). Relaxation for depression. Cochrane Database Syst Rev. 4.
- Kennedy, S.H. et al. (2009). Canadian Network for Mood and Anxiety Treatments (CANMAT) Clinical guidelines for the management of major depressive disorders in adults. IV. Neurostimulation therapies. Journal of Affective Disorders, 117, S44-S53.
- Kocsis, J.H. et al. (2009). Cognitive behavioral analysis system of psychotherapy and

- brief supportive psychotherapy for augmentation of antidepressant nonresponse in chronic depression: the REVAMP Trial. Archives of General Psychiatry, **66(11)**, 1178-1188.
- Lee, S.H. et al. (2007). Effectiveness of a meditation-based stress management program as an adjunct to pharmacotherapy in patients with anxiety disorder. Journal of Psychosomatic Research, 62, 189-195.
- Mahler, C. et al. (2010). Assessing reported adherence to pharmacological treatment recommendations. Translation and evaluation of the Medication Adherence Report Scale (MARS) in Germany. Journal of Evaluation in Clinical Practice, **16**, 574-579.
- Mathers, C.D., & Loncar, D. (2006). Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Medicine*, **3**(11), 2011-31.
- McConville, T., Dusek, K., & Dusek, J. (2012). P03. 11. Relaxation response intervention induces respiration and heart rate variability changes in hypertensives. BMC Complementary and Alternative Medicine, 12(Suppl 1): P264.
- McEvoy, P.M., & Nathan, P. (2007). Effectiveness of cognitive behavior therapy for diagnostically heterogeneous groups: A benchmarking study. Journal of Consulting and Clinical Psychology, **75.2**, 344.
- McGillivray, J.A., & Evert, H.T. (2014). Group Cognitive Behavioural Therapy program shows potential in reducing symptoms of depression and stress among young people with ASD. Journal of Autism and Developmental Disorders, 1-11.
- Merikangas, K.R. et al. (2010). Lifetime prevalence of mental disorders in US adolescents: results from the National Comorbidity Survey Replication

- Adolescent Supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry*, **49**, 980-989.
- Nakao, M. et al. (2001). Anxiety is a good indicator for somatic symptom reduction through behavioral medicine intervention in a mind/body medicine clinic.

  \*Psychotherapy and Psychosomatics, 70, 50-57.
- NICE clinical guideline 90 (2009). Depression in adults. <a href="www.nice.org.uk/cg90">www.nice.org.uk/cg90</a>
- NICE clinical guideline 113 (2011). Generalised anxiety disorder and panic disorder (with or without agoraphobia) in adults. www.nice.org.uk/cg113
- Osborne, L.A., McHugh, L., Saunders, J., & Reed, P. (2008). Parenting stress reduces the effectiveness of early teaching interventions for autistic spectrum disorders. *Journal of Autism and Developmental Disorders*, **38**, 1092-1103.
- Pigott, H.E., Leventhal, A.M., Alter, G., & Boren, J. (2010). Efficacy and effectiveness of antidepressants: current status of research. *Psychotherapy and Psychosomatics*, **79**(5), 267-279.
- Prinz, U. et al. (2013). Comparative psychometric analyses of the SCL-90-R and its short versions in patients with affective disorders. *BMC Psychiatry*, **13**: 104.
- Prunas, A., Sarno, I., Preti, E., Madeddu, F., & Perugini, M. (2012). Psychometric properties of the Italian version of the SCL-90-R: A study on a large community sample. *European Psychiatry*, **27**, 591-597.
- Scelzo, E., Ferrucci, R., Bortolomasi, M., Giacopuzzi, M., & Priori, A. (2011). P02 558-Transcranial direct current stimulation (TDCS) for severe drug resistant major depression: A ten days treatment protocol. *European Psychiatry*, 26, 1154.
- Schatzberg, A.F. et al. (2005). Chronic depression: medication (nefazodone) or psychotherapy (CBASP) is effective when the other is not. *Archives of*

- *General Psychiatry*, **62(5)**, 513–520.
- Scimeca, G., Bruno, A., Cava, L., Pandolfo, G., Muscatello, M.R.A., & Zoccali, R. (2014). The relationship between alexithymia, anxiety, depression, and internet addiction severity in a sample of Italian high school students. The Scientific World Journal, 2014, 1-8.
- Spielberger, C.D. (1983). State-Trait Anxiety Inventory STAI (Form Y). Palo Alto, CA: Consulting Psychologists Press, Inc.
- Trivedi, M.H. et al. (2006). Evaluation of outcomes with citalogram for depression using measurement based care in STAR\*D: Implications for clinical practice. American Journal of Psychiatry, **163**, 28-40.
- Truzoli, R. et al. (2011). Effectiveness and feasibility of a Relaxation clinical training for anxiety and depression symptoms reduction in a psychiatric setting: preliminary results. EABG (Experimental Analysis of Behaviour Group) *Meeting: "The London Conference"*, London.
- Turner, J.A. (1982). Comparison of group progressive-relaxation training and cognitive-behavioral group therapy for chronic low back pain. Journal of Consulting and Clinical Psychology, **50(5)**, 757.
- Twohig, M.P. et al. (2010). A randomized clinical trial of acceptance and commitment therapy versus progressive relaxation training for obsessive compulsive disorder. Journal of Consulting and Clinical Psychology, 78, 705.
- Wiles, N. et al. (2014). Cognitive behavioural therapy as an adjunct to pharmacotherapy for primary care based patients with treatment resistant depression: results of the CoBalT randomised controlled trial. Lancet, 381, 375-384

Table 1: Mean (standard deviations) for overall symptoms (SCL-90), depression (BDI), and anxiety (STAI) for the sample pre and post treatment, as well as the mean change score (post minus pre) and the correlations between the change score and the participants age (Pearson) and gender (point biserial).

| Overall                  | Pre              | Post             | Change            | Age  | Gender | Change t(39) | d     |
|--------------------------|------------------|------------------|-------------------|------|--------|--------------|-------|
| Symptom<br>Number        | 94.13<br>(37.39) | 66.05<br>(38.33) | -28.08<br>(31.41) | .316 | 079    | 5.63***      | .893  |
| Depression (BDI)         | 15.77<br>(7.58)  | 12.24<br>(7.41)  | -3.53<br>(6.96)   | .143 | 128    | 3.20**       | .506  |
| Depression<br>(Hamilton) | 19.15<br>(5.95)  | 12.77<br>(5.27)  | -6.35<br>(4.31)   | .162 | 275    | 9.32***      | 1.475 |
| Anxiety<br>(STAI)        | 53.33<br>(11.56) | 49.25<br>(10.51) | -4.08<br>(8.84)   | .261 | 001    | 2.92**       | .461  |
| Anxiety<br>(Hamilton)    | 18.00<br>(5.90)  | 11.18<br>(4.99)  | -6.82<br>(5.99)   | 018  | 162    | 7.20***      | 1.140 |
|                          |                  |                  |                   |      |        |              |       |

<sup>\*</sup> p < .05; \*\* p < .01; \*\*\* p < .001

Table 2: Mean (standard deviations) for overall symptoms (SCL-90), depression (BDI), and anxiety (STAI) for the sample pre and post treatment, as well as the mean change score (post minus pre) and the correlations between the change score and the participants age (Pearson) and gender (point biserial). Also shown is the clinical significance change for depressed participants.

| Depressed                | Pre              | Post             | Change            | Age    | Gender | Change t(39) | d     |
|--------------------------|------------------|------------------|-------------------|--------|--------|--------------|-------|
| Symptom<br>Number        | 92.71<br>(35.61) | 57.88<br>(31.58) | -34.83<br>(31.40) | .543** | 192    | 5.43***      | 1.109 |
| Depression (BDI)         | 15.92<br>(7.76)  | 13.17<br>(8.43)  | -2.75<br>(6.95)   | .158   | 130    | 1.94*        | .396  |
| Depression<br>(Hamilton) | 19.83<br>(5.70)  | 12.88<br>(6.05)  | -6.96<br>(4.21)   | .078   | 229    | 8.10***      | 1.658 |
| Anxiety<br>(STAI)        | 53.00<br>(10.41) | 48.17<br>(9.50)  | -4.83<br>(7.02)   | .497   | 240    | 3.37**       | .688  |
| Anxiety<br>(Hamilton)    | 18.46<br>(6.64)  | 10.54<br>(4.73)  | -7.92<br>(5.37)   | 025    | 224    | 7.22***      | 1.475 |

<sup>\*</sup> p < .05; \*\* p < .01; \*\*\* p < .001

Table 3: Mean (standard deviations) for overall symptoms (SCL-90), depression (BDI), and anxiety (STAI) for the sample pre and post treatment, as well as the mean change score (post minus pre) and the correlations between the change score and the participants age (Pearson) and gender (point biserial). Also shown is the clinical significance change for anxious participants.

| Anxious                  | Pre              | Post             | Change            | Age  | Gender | Change t(39) | d     |
|--------------------------|------------------|------------------|-------------------|------|--------|--------------|-------|
| Symptom<br>Number        | 96.25<br>(41.02) | 78.31<br>(44.98) | -17.94<br>(29.48) | .014 | 005    | 2.43*        | .609  |
| Depression<br>(BDI)      | 15.56<br>(7.56)  | 10.88<br>(5.52)  | -4.69<br>(7.04)   | .145 | 072    | 2.66*        | .666  |
| Depression<br>(Hamilton) | 18.06<br>(6.33)  | 12.62<br>(4.02)  | -5.44<br>(4.42)   | .250 | 460    | 4.91***      | 1.234 |
| Anxiety<br>(STAI)        | 53.81<br>(13.46) | 50.88<br>(11.99) | -2.94<br>(11.20)  | .073 | 239    | 1.05         | .376  |
| Anxiety<br>(Hamilton)    | 17.31<br>(4.70)  | 12.13<br>(5.38)  | -5.19<br>(6.65)   | 036  | 188    | 3.12**       | .779  |

<sup>\*</sup> p < .05; \*\* p < .01; \*\*\* p < .001

Table 4: Percentage of participants in overall sample, and with depression or anxiety disorders, showing improvement according to four criterion: actual = change in raw score; reliable = statistically reliable change; cut-off = decreasing from above to below scale cut-off point; and clinical = decrease from above to below point for clinical significance.

|               |           | Actual | Reliable | Cut-off | Clinical |
|---------------|-----------|--------|----------|---------|----------|
| SCL-90 Sample |           | 87.5   | 27.5     | 48.4    | 39.4     |
|               | Depressed | 91.7   | 37.5     | 66.7    | 50.0     |
|               | Anxious   | 81.3   | 12.5     | 23.1    | 23.1     |
| BDI           | Sample    | 65.0   | 25.0     | 46.4    | 25.0     |
|               | Depressed | 62.5   | 25.0     | 43.8    | 25.0     |
|               | Anxious   | 68.8   | 25.0     | 50.0    | 25.0     |
| HAMD          | Sample    | 92.5   | 67.5     | 17.9    | 12.8     |
|               | Depressed | 95.8   | 70.8     | 25.0    | 16.7     |
|               | Anxious   | 87.5   | 62.5     | 6.7     | 6.7      |
| STAI          | Sample    | 62.5   | 35.0     | 6.5     | 0        |
|               | Depressed | 79.2   | 37.5     | 10.5    | 0        |
|               | Anxious   | 37.5   | 31.3     | 0       | 0        |
| HAMA          | Improve   | 90.0   | 52.5     | 47.4    | 63.2     |
|               | Depressed | 95.8   | 58.3     | 52.2    | 69.6     |
|               | Anxious   | 81.3   | 43.8     | 40.0    | 53.3     |

Figure 1. Mean change score per item for the subscales of the SCL-90 for the overall sample, and for the participants with either a depressive or anxiety disorder.

