RESEARCH ARTICLE

ANXIETY AND DEPRESSION ASSOCIATION OF AMERICA WILEY

# Group autonomy enhancing treatment versus cognitive behavioral therapy for anxiety disorders: A cluster-randomized clinical trial

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## Abstract

**Background:** Although cognitive behavioral therapy (CBT) is effective in the treatment of anxiety disorders, few evidence-based alternatives exist. Autonomy enhancing treatment (AET) aims to decrease the vulnerability for anxiety disorders by targeting underlying autonomy deficits and may therefore have similar effects on anxiety as CBT, but yield broader effects.

**Methods:** A multicenter cluster-randomized clinical trial was conducted including 129 patients with DSM-5 anxiety disorders, on average 33.66 years of age ($SD = 12.57$), 91 (70.5%) female, and most (92.2%) born in the Netherlands. Participants were randomized over 15-week groupwise AET or groupwise CBT and completed questionnaires on anxiety, general psychopathology, depression, quality of life, autonomy-connectedness and self-esteem, pre-, mid-, and posttreatment, and after 3, 6, and 12 months (six measurements).

**Results:** Contrary to the hypotheses, effects on the broader outcome measures did not differ between AET and CBT ($d = .16$ or smaller at post-test). Anxiety reduction was similar across conditions ($d = .059$ at post-test) and neither therapy was superior on long term.

**Conclusion:** This was the first clinical randomized trial comparing AET to CBT. The added value of AET does not seem to lie in enhanced effectiveness on broader outcome measures or on long term compared to CBT. However, the study supports the effectiveness of AET and thereby contributes to extended treatment options for anxiety disorders.

**KEYWORDS**
anxiety, autonomy, autonomy enhancing treatment, autonomy-connectedness, cognitive behavioral therapy, transdiagnostic

# 1 | INTRODUCTION

Anxiety disorders are highly prevalent, affecting 11.6% of the global population yearly (Baxter et al., 2013), women almost twice as often as men (Remes et al., 2016), and frequently presenting with comorbid other anxiety (48%–68%) or depressive disorders (63%; Lamers et al., 2011). The recommended psychotherapy, cognitive behavioral therapy (CBT), targets maladaptive cognitions and dysfunctional behavioral anxiety-related patterns, by challenging automatic thoughts about feared situations and by fear exposure. Numerous meta-analyses (Carpenter et al., 2018; Cuijpers et al., 2016; Hofmann & Smits, 2008; Stewart & Chambless, 2009) demonstrated CBT's effectiveness for anxiety disorders in individual as well as group formats (Barkowski et al., 2016), effect sizes being typically medium to large compared to waitlist control conditions (Cuijpers et al., 2016). However, only 51% of anxiety disorder patients reach remission after receiving CBT (Springer et al., 2018), some patients refuse CBT (Goetter et al., 2020), and one in five discontinue therapy prematurely (Taylor et al., 2012). Fear of the therapy itself likely plays a role in treatment refusal (Cougle, 2012; Goetter et al., 2020). Most multidisciplinary guidelines list no, or only few, other effective evidence-based psychotherapeutic interventions for anxiety disorders (American Psychiatric Association, 2009; Baldwin et al., 2014; Katzman et al., 2014; National Institute for Health and Care Excellence, 2020; Trimbos Institute, 2013).

The present study therefore compared CBT to a novel approach to anxiety disorders, autonomy enhancing treatment (AET). AET is a transdiagnostic psychotherapy based on the rationale that deficits in autonomy-connectedness act as a vulnerability factor for the development and maintenance of anxiety- and other disorders (Bekker et al., 2016). Autonomy-connectedness is the capacity for self-governance in an interpersonal context (Bekker & van Assen, 2006). Anxiety patients may have difficulty identifying their own needs and wishes, tend to focus excessively on the needs of others, and are typically sub-assertive (Hawke & Provencher, 2012; Russell et al., 2011). Such autonomy deficits can be conceptualized using the three components of autonomy-connectedness: (i) "self-awareness," the awareness of one's wishes, needs, and opinions, and the ability to communicate and pursue these in interpersonal relationships (Bekker & van Assen, 2006). Individuals high in self-awareness have a clear sense of identity and self-concept, are effective at communicating their needs and wishes (Bekker et al., 2008), and seem more resilient when facing interpersonal stressors (Kunst et al., 2019). Further, (ii) "sensitivity towards others" is the sensitivity towards the wishes, needs, and desires of other people, including the need and capacity for intimacy; and (iii) "capacity for managing new situations" reflects the tendency to explore new environments, flexibility, and independency of familiar structures (Bekker & van Assen, 2006).

Studies on internalizing disorders consistently showed lower levels of self-awareness and capacity for managing new situations, and higher sensitivity towards others, in individuals with anxiety or depression (symptoms or disorders) compared with healthy controls (Bekker & Belt, 2006; Bekker & Croon, 2010; Bekker & van Assen, 2017; Kunst et al., 2019; Maas, Laceulle, et al., 2019). Studies using different conceptualizations of autonomy deficits also show consistent and positive associations with anxiety symptoms across healthy and patient populations (e.g., Cámara & Calvete, 2012; Dunkley et al., 2006; Hallam et al., 2014; Hawke & Provencher, 2012). Maladaptive autonomy-connectedness patterns may predispose individuals to design one's life incongruently with own wishes and needs, raising chronic distress, and experiencing a chronic lack of control, thereby adopting avoidant and ruminative coping styles. AET therefore aims to strengthen self-awareness and capacity for managing new situations and to normalize one's sensitivity to others (Bekker et al., 2016). A recent pilot indicated that AET was acceptable to patients and therapists, feasible to carry out in specialized mental health care, and indications were found for effectiveness compared with a waitlist control condition (Maas, van Balkom, et al., 2019). However, this study was underpowered and AET has never been compared directly to CBT.

The present study aimed to compare CBT versus AET in a mixed group of anxiety disorders. Because AET is primarily group-based psychotherapy, we compared AET to group-based CBT. We expected broader effects for AET than CBT (i.e., enhanced effects on general psychopathology, comorbid depressive symptoms, quality of life, autonomy-connectedness, self-esteem), and no significant differences for anxiety change. Additionally, treatment expectancies, adherence and evaluation, and long-term effects were explored.

## 2 | MATERIALS AND METHODS

### 2.1 | Design

The present study was a multicenter cluster-randomized clinical trial on the comparative effectiveness of 15-week group-AET and -CBT for anxiety disorders. Patients were randomly allocated to AET or CBT; outcome measures were assessed at six time points: pre-, mid-, and posttreatment, and at 3-, 6-, and 12-month follow-up. Eight treatment centers in the Netherlands participated in the study. The study was approved by the Brabant Medical Ethical Committee (#NL59064.028.16) and preregistered at the Netherlands Clinical Trial Registry (https://www.trialregister.nl/trial/6250)

### 2.2 | Participants

Participants were 129 adult patients with DSM-5 anxiety disorders (panic disorder, social anxiety disorder, generalized anxiety disorder, agoraphobia, or specific phobia), aged $M = 33.66$ ($SD = 12.57$), 91 (70.5%) female (Table 1). Improving generalizability of our findings to the population of anxiety patients, comorbidity was permitted in our trial: 45.7% of participants had one or multiple comorbid anxiety disorder(s) and 34.1% had a comorbid depressive disorder. Exclusion criteria were: insufficient mastery of Dutch language, suspected intellectual disability, psychosis, addiction, severe personality pathology, acute bereavement, severe acute suicidality, and/or having undergone AET, CBT, or medication changes in the past 3 months. Stable use of psychopharmacological drugs (>3 months) was allowed.

### 2.3 | Procedure and randomization

Figure 1 displays patients' inclusion flow. Patients referred to one of the eight treatment centers underwent an intake procedure following Dutch multidisciplinary guidelines (inclusion: February 2017 to July 2019, follow-up stop: November 2019). Those diagnosed with a primary DSM-5 anxiety disorder and interested in research (n = 219) were contacted by author Laura E. Kunst by phone to assess eligibility and diagnoses (using the MINI International Neuropsychiatric Interview, version 5.0.0.; Sheehan et al., 1998; Vliet & de Beurs, 2007), which has excellent inter-rater reliability and good concurrence with more extensive clinical interviews (Sheehan et al., 1997). Written informed consent was obtained from all patients. Cluster-based randomization was applied (Teerenstra et al., 2006; Method s1). Each treatment center administered both AET and CBT groups in a pre-determined, randomized, and balanced order, ensuring an equal distribution of both within each center. To limit potential selection bias associated with cluster-randomized procedures, we instructed treatment centers to blind intake staff for each upcoming condition, and during screening we verified that patients were unaware of treatment allocation.

Included participants received questionnaires 1 week before the first group session (pre-test), after the seventh session (mid-test), and after the last session (post-test). Follow-up measurements were performed after 3, 6, and 12 months (see Method s2). Due to the project's time limit of 3 years, the first therapy groups received questionnaires at all six time points, and the final groups only at the pre-, mid-, and post-test. Patients were asked to refrain from additional treatment for 3 months after post-test.

### 2.4 | Treatments

AET consisted of 15 weekly 2-h sessions following the protocol of Bekker et al. (2016), see Method s2 for details and a session-by-session overview. AET groups had an average of 8 participating patients at baseline (range 5–11). Sessions 1–5 consisted of psycho-education about autonomy-connectedness and its relation to psychopathology, and setting autonomy-related personal goals. From session 2 onward, patients took turns chairing the therapy sessions (opening and structuring the session, managing time), so that every patient led a total of one or two sessions, and so that therapy groups became increasingly "autonomous." Sessions 6–12 featured different autonomy-related themes each week, serving as psycho-education as well as grounds for discussion over autonomy-related difficulties (e.g., relationships, boundaries, body and sexuality, emotions), and sessions 13–15 included relapse prevention. Key elements of CBT for anxiety disorders (e.g., behavioral experiments, interoceptive exposure, metacognitions, addressing self-monitoring and safety behaviors) were not applied within AET.

CBT also consisted of 15 weekly 2-h sessions. CBT groups had an average of 7 participating patients at baseline (range 5–9). CBT was administered following the evidence-based protocol of Keijsers et al. (2017), the gold standard CBT protocol used in the Netherlands. In terms of international literature, the protocol corresponds with treatment principles as described by Barlow and Craske (2007) for panic disorder; Clark and Wells (1995), and Hofmann and Otto (2008) for social anxiety disorder; gradual exposure in vivo for specific phobia (Wolitzky-Taylor et al., 2008); and cognitive therapy based on Beck et al. (1985) and the metacognitive model (Wells, 1995, 1997) for generalized anxiety disorder. To summarize, all sessions started with a relaxation exercise and homework discussion; sessions 1–3 focused on psycho-education following CBT anxiety models and formulating personal CBT-goals as well as anxiety registration and thought records, sessions 4–12 covered identifying and challenging maladaptive automatic thoughts, interoceptive and in vivo exposure, addressing meta-cognitions, behavioral experiments, and challenging core beliefs, and sessions 13–15 included relapse prevention (for a more elaborate description, see Method s2).

### 2.5 | Therapists and training

Thirty-seven therapists participated in the study, aged $M = 38.32$ ($SD = 11.66$), 94.6% female, with on average 10.77 ($SD = 9.39$) years of experience in mental health care and ample experience with CBT for

**TABLE 1** Patient characteristics, treatment expectancies, adherence and evaluation, by condition (n = 129)

| | AET (n = 62) N (%) | CBT (n = 67) N (%) | $X^2$ (p) | | AET (n = 62) M (SD) | CBT (n = 67) M (SD) | t (p) | d |
|---|---|---|---|---|---|---|---|---|
| *Sex* | | | | *Age* | 34.59 (13.59) | 32.81 (11.84) | −.80 (.425) | 0.14 |
| Female | 46 (50.5) | 45 (49.5) | .77 (.382) | | | | | |
| | | | | *Expectancies* | | | | |
| *Education* | | | | Expected effectiveness | 3.61 (0.94) | 3.55 (0.78) | .33 (.744) | 0.07 |
| Primary school | 1 (50) | 1 (50) | 3.53 (.618) | Motivation | 4.59 (0.62) | 4.63 (0.65) | −.36 (.722) | −0.066 |
| Lower secondary | 7 (36.8) | 12 (63.2) | | | | | | |
| Higher secondary | 12 (48) | 13 (52) | | *Adherence* (n = 97) | | | | |
| Intermediate vocational | 21 (58.3) | 15 (41.7) | | Missed sessions | 1.56 (1.25) | 1.35 (1.22) | .86 (.391) | 0.18 |
| Higher vocational | 16 (47.1) | 18 (52.9) | | Weekly minutes homework | **89.69 (54.70)** | **150.61 (120.54)** | **−3.22 (.002)** | −0.65 |
| University degree | 4 (33.3) | 8 (66.7) | | Homework adherence | 4.15 (1.19) | 3.92 (1.038) | 1.006 (.317) | 0.20 |
| *Country of birth* | | | | *Evaluation* (n = 97) | | | | |
| The Netherlands | 55 (46.2) | 64 (53.8) | 2.09 (.148) | Treatment satisfaction | 7.63 (1.68) | 7.71 (1.099) | −.31 (.758) | −.056 |
| | | | | Therapist alliance | 4.27 (0.68) | 4.33 (0.59) | −.43 (.667) | −.092 |
| *Primary diagnosis* | | | | Group alliance | **4.56 (0.49)** | **4.32 (0.60)** | **2.21 (.030)** | .45 |
| Social anxiety | 24 (47.1) | 27 (52.9) | 7.019 (.219) | Too much homework | **2.94 (0.38)** | **3.22 (0.51)** | **−.31 (.002)** | −.62 |
| Generalized anxiety dis. | 18 (60) | 12 (40) | | Therapy strain | 3.50 (0.99) | 3.67 (0.99) | −.86 (.390) | −.17 |
| Panic disorder | 11 (36.7) | 19 (63.3) | | Person (vs. symptom) focused | **3.31 (0.88)** | **2.65 (0.72)** | **4.039 (<.001)** | .82 |
| Agoraphobia | 0 | 3 (100) | | Focus on core of the problem | 3.54 (1.41) | 3.76 (1.15) | −.82 (.417) | −.17 |
| Specific phobia | 1 (50) | 1 (50) | | | | | | |
| Not otherwise specified | 8 (61.5) | 5 (38.5) | | | N (%) | N (%) | $\square^2$ (p) | |
| | | | | *Previous treatments* | | | | |
| *Comorbidity* | | | | No | 10 (37) | 17 (63) | 4.79 (.310) | |
| 1≤ other anxiety disorder | 31 (52.5) | 28 (47.5) | .87 (.350) | 1 treatment of 1 year or less | 24 (53.3) | 21 (46.7) | | |
| Any depressive disorder | 21 (47.7) | 23 (52.3) | .003 (.956) | 1 treatment of 1–2 years or 2 short treatments | 17 (54.8) | 14 (45.2) | | |
| | | | | 1 treatment of 3–7 years or 3–5 short treatments | 10 (50) | 10 (50) | | |
| *Psychotropic medication* | | | | 1 treatment longer than 8 years or 6≤ treatments | 1 (16.7) | 5 (83.3) | | |
| No | 42 (47.7) | 46 (52.3) | .012 (.911) | | | | | |
| Benzodiazepines | 10 (40) | 15 (60) | 1.98 (.160) | *Previous CBT for anxiety* | | | | |
| Antidepressants | 10 (55.6) | 8 (44.4) | .59 (.443) | Yes, probably | 14 (46.7) | 16 (53.3) | | |
| Bèta blockers, | 6 (54.5) | 5 (45.5) | .20 (.655) | No, probably not | 34 (48.6) | 36 (51.4) | | |
| antipsychotics or anticonvulsants | | | | Unclear | 14 (48.3) | 15 (51.7) | | |

anxiety. Each AET and CBT therapy group was administered by two therapists, one of whom was always an experienced psychologist with 2<years of post-master clinical training. All AET therapists received a 1-day AET training. Most (89.2%) therapists administered either AET or CBT groups and four (10.8%) experienced therapists administered AET as well as CBT groups (see treatment integrity ratings). Regular supervision meetings by phone were organized, led by Brenda Kouwenhoven for AET and Kees Korrelboom for CBT (Method s3).
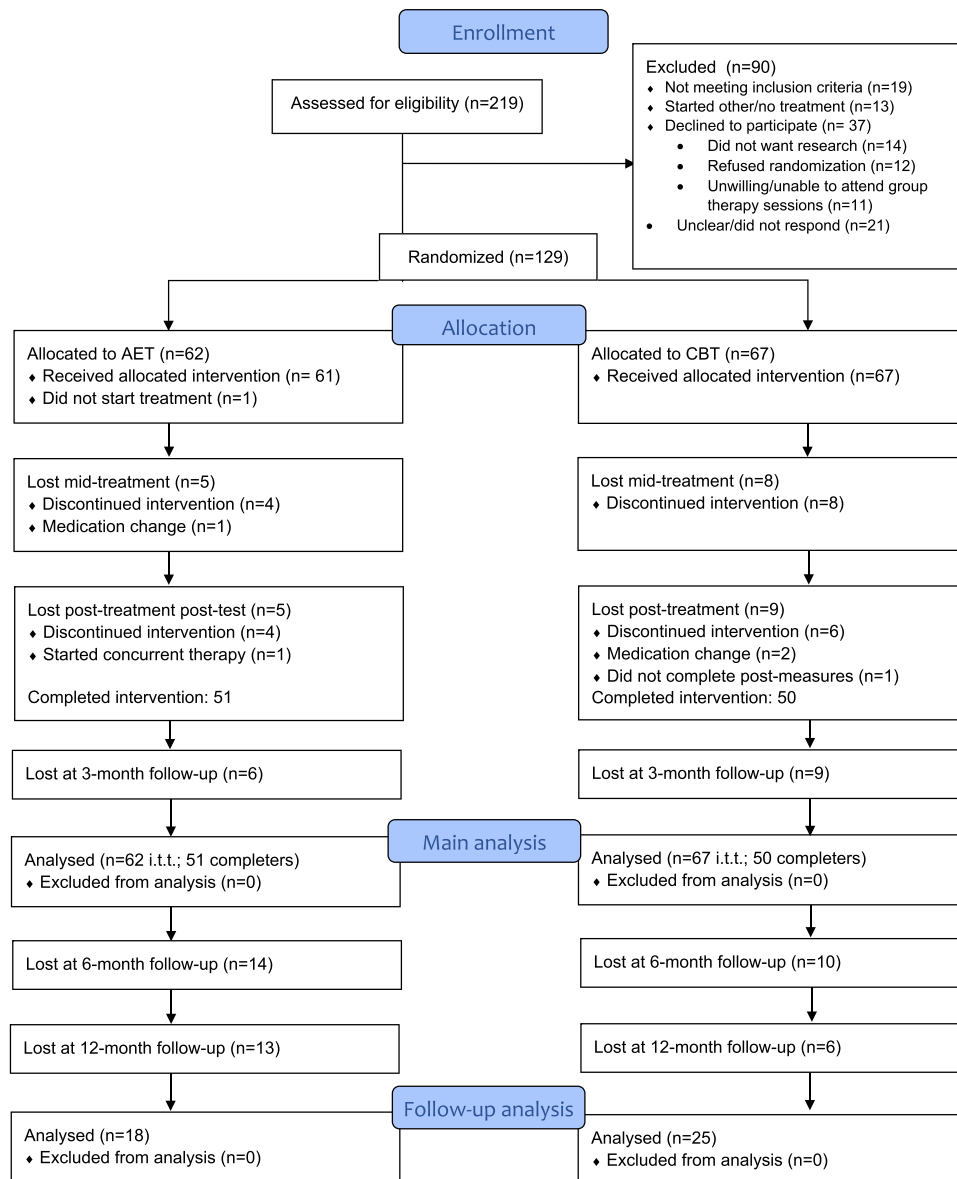
**FIGURE 1** CONSORT flow diagram

## 2.6 | Treatment integrity ratings

Treatment integrity was assessed by rating 20% of the audio-recorded therapy sessions (Perepletchikova, 2011) for strict adherence to the AET and CBT protocols (scale from 0 to 10). Additionally, use of AET (e.g., focusing on self-acceptance, stimulating awareness and expression of needs) and CBT techniques (e.g., challenging thoughts, discussing symptom registration, planning behavioral experiments) were scored on a scale from 0 to 5 (see Method s3). Not all techniques were expected to be applied in every session: For instance, a perfect CBT session focusing on challenging thoughts would not receive a perfect score on use of CBT techniques, if behavioral experiments and symptom registration were not discussed in that session. We also expected some overlap in utilized techniques between conditions, because using basic therapeutic skills in response to behaviors initiated by patients can sometimes be rated as either CBT or AET techniques. For example, asking a patient within AET what exactly they fear, could be considered a CBT technique (challenging thoughts), and complimenting a patient who assertively expressed their needs in a CBT session, could be considered an AET technique (stimulating expression of needs). However, AET techniques were expected to be applied more in AET than CBT and vice versa.

Sessions were rated independently by two out of seven available raters and interrater reliabilities were computed using the intraclass correlation (ICC), based on two-way random effects model for absolute agreement and average measures (Gisev et al., 2013). Rater agreement was good for ratings of protocol adherence (ICC = .77) and moderate for ratings of therapeutic techniques (ICC = .69). Protocol adherence was high ($M = 8.62$ for AET [$SD = 2.28$] and $M = 8.36$ for CBT [$SD = 2.43$]), indicating that the sessions were provided as described in the protocols and that the treatments were clearly distinct. As expected, CBT

techniques were applied more in CBT ($M = 2.016$, $SD = 1.42$) than in AET groups ($M = 0.85$, $SD = 0.81$, $t(251.4) = 8.38$, $p < .001$), and AET techniques were applied more in AET ($M = 2.32$, $SD = 1.23$) than CBT groups ($M = 1.17$, $SD = 0.91$, $t(187.19) = -8.30$, $p < .001$).

## 2.7 | Primary outcome measures

Anxiety (10 items) and general psychopathology were measured using the Symptom Checklist (SCL-90), consisting of 90 5-point Likert items and nine (sub)scales: Agoraphobia, Anxiety, Depression, Somatization, Cognitive-performance deficits, Interpersonal sensitivity, Hostility, Sleep difficulties, and General psychopathology (total score; Arrindell & Ettema, 1975, 2005; Derogatis, 1994), asking if patients experienced symptoms in the past week. Cronbach's alphas for anxiety ranged from $\alpha = .87$ (12-month follow-up) to $\alpha = .92$ (mid-test); for General psychopathology the range was $\alpha = .97$ (pre-test) to .98 (post-test).

Depressive symptoms were measured using the 21-item (four answering categories) Beck Depression Inventory (BDI-II-NL; Beck et al., 1996; Beck et al., 2002), which has excellent psychometric properties (Beck et al., 1988). Reliability in the present study ranged from $\alpha = .89$ (mid-test) to $\alpha = .92$ (3-month follow-up).

Quality of life was measured using the 26-item World Health Organization quality of life brief questionnaire (WHO-QoL-BREF), which assesses QoL in domains of physical health, psychological well-being, social relationships, and environment. It has good psychometric properties (World Health Organization, 1998), with reliability ranging from $\alpha = .90$ (pre-test) to $\alpha = .93$ (6-month follow-up).

Autonomy-connectedness was measured using the 30-item (five answering categories) Autonomy-Connectedness Scale (ACS-30), with subscales self-awareness (7 items), Sensitivity to others (17 items), and Capacity for managing new situations (6 items). Construct validity and internal reliability are good (Bekker & van Assen, 2006). Reliabilities in the present study ranged from $\alpha = .81$ (6-month follow-up) to $\alpha = .87$ (12-month follow-up) for self-awareness, from $\alpha = .83$ to $\alpha = .87$ (3-month follow-up) for Sensitivity to others, and from $\alpha = .74$ (12-month follow-up) to $\alpha = .84$ (6-month follow-up) for Capacity for managing new situations.

Self-esteem was assessed using the 10-item (four categories) Rosenberg Self-esteem Scale (RSES; Rosenberg, 1965), which has good psychometric qualities (Franck et al., 2008). Reliabilities in the present study ranged from $\alpha = .85$ (pre-test) to $\alpha = .90$ (3-month follow-up).

## 2.8 | Patient characteristics and secondary outcome measures

Previous treatments, treatment expectancies, adherence, and evaluation were assessed using 5-point Likert scales and open-ended questions (Method s4).

## 2.9 | Power considerations

A priori sample size calculation using G*Power 3.1.9.2, for independent $t$-tests on comparing change scores between conditions, medium effect size ($d = .5$), revealed that $n = 128$ participants (64 per group) were needed to achieve a power of .80.

## 2.10 | Statistical analysis

A detailed description is included in Method s5. All analyses were conducted in SPSS (v.26) using an alpha of .05 and two-tailed testing. For the primary outcome analyses, an intention-to-treat (i.t.t.; $n = 129$) and completers (excluding drop-outs, $n = 101$) approach was used. Data of pre, mid, post-test, and 3-month follow-up were used; 6- and 12-month follow-up time points were examined exploratively due to their low completion rates. Primary outcome analyses were carried out using linear mixed modeling with an unstructured covariance matrix at the level of individuals (as MANOVA), and a random intercept for therapy group to control for dependency within therapy groups (level 2). Two models were estimated for each of the primary outcome measures and compared using the likelihood ratio test: (0) A null-model including fixed and random intercept and unstructured covariance matrix for pre-test to 3-month follow-up. Model (I) also included a main effect of condition (0 = CBT, 1 = AET) and of time (three time dummies reflecting the difference compared with baseline). In model (II) three interaction terms were added between conditions and each of the time dummies. Main hypotheses on a different change in the outcome measure between conditions were tested using the $t$-statistic of the interaction terms in model (II) for timepoints pre-test to post-test and pre-test to 3-month follow-up.

Although the presence of multiple outcome measures inflates the chance of Type-I error, Bonferroni correction would excessively inflate the Type-II error probability. We therefore chose to base our conclusions on the uncorrected tests, but also reported whether the outcomes would differ using a corrected alpha of $.05/8 = .0063$. Effect sizes were calculated for within-subject changes per condition as well as for between-subjects (AET vs. CBT) using Glass's *delta* (Lakens, 2013; Morris, 2008), which is more conservative than within-subject Cohen's $d_{rm}$. Pre-test standard deviations were pooled across conditions to obtain more reliable estimates of the population standard deviations and to facilitate comparison between conditions (Lakens, 2013; Tables S1–S8). Moderator analyses were performed using bootstrapped regression analyses (see Methods S5) to assess whether treatment response varied by demographic and clinical characteristics.

## 3 | RESULTS

Participant characteristics are depicted in Table 1 and descriptive statistics are presented in Tables 2 and S1–S8. Intention-to-treat (Table 3, model I) as well as completers (Table S9) analyses showed that all outcomes improved from pre-test to all subsequent time points in the sample as a

**TABLE 2** Means, standard deviations, and correlations between variables under study

| | Means | | | | Correlations | | | | | | | | |
| | AET | | CBT | | | | | | | | | | |
| | M | SD | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Age | 34.59 | 13.59 | 32.81 | 11.84 | – | | | | | | | | |
| 2. Sex | – | – | – | – | .015 | – | | | | | | | |
| 3. Anxiety | 26.26 | 9.44 | 24.12 | 8.24 | −.22* | .045 | – | | | | | | |
| 4. Psychopathology | 215.016 | 58.95 | 201.10 | 61.36 | −.16 | .15 | .86** | – | | | | | |
| 5. Depression | 22.66 | 10.091 | 19.99 | 11.23 | −.087 | .21* | .64** | .82** | – | | | | |
| 6. Quality of life | 12.54 | 2.025 | 13.24 | 2.037 | .034 | −.093 | −.59** | −.73** | −.75** | – | | | |
| 7. SA | 2.58 | 0.84 | 2.85 | 0.89 | −.15 | −.20* | −.026 | −.24** | −.30** | .22* | – | | |
| 8. SO | 4.20 | 0.51 | 3.96 | 0.58 | −.004 | .44** | .17 | .26** | .24** | −.23* | −.31** | – | |
| 9. CMNS | 2.18 | 0.79 | 2.19 | 0.77 | .007 | .046 | −.32** | −.39** | −.31** | .36** | .28** | −.061 | – |
| 10. Self-esteem | 23.41 | 4.68 | 24.045 | 4.79 | .089 | −.21* | −.33** | −.55** | −.61** | .62** | .38** | −.43** | .31** |

*Note*: sex is coded as 0=male, 1=female. *p < .05; **p < .01.

whole. Within-subject changes in anxiety, psychopathology, and depression at post-test and follow-up were large in both conditions (Tables 3 and S9). As expected, changes in anxiety were not significantly different between AET and CBT (shown in Figure 2). In contrast to the hypotheses, no differences between AET and CBT emerged for the broader outcomes: general psychopathology, comorbid depressive symptoms, quality of life, autonomy-connectedness, and self-esteem. These results did not vary by intention-to-treat vs. completer sample. Favorable treatment response (i.e., larger anxiety changes from pre- to post-test) and differential treatment response to AET versus CBT were not predicted by possible moderators sex, age, education level, prior CBT treatment, or primary diagnosis (social and generalized anxiety disorder vs. other anxiety disorders), *ps* > .05. Adopting a Bonferroni-corrected alpha of .05/8 = .0063 would eliminate the one *-marked correlations in Table 2 and the changes in Sensitivity to others and Capacity for managing new situations from pre-test to mid-test (Tables 3 and S9), not affecting the main conclusions.

## 3.1 | Exploration of secondary outcomes

Treatment expectancies, motivation, and satisfaction were similar across conditions (Table 1). Patients undergoing CBT spent more time on homework than the AET group (medium effect; Table 1). Patients receiving the AET group rated the bond with their fellow group members as more positive (small to medium effect) than those receiving CBT. Patients in the AET group more frequently rated their therapy as being mostly or fully person-centered (43.8%) than in the CBT group (8.1%), whereas 42.8% of the patients in the CBT group rated their therapy as mostly or fully symptom-focused (16.7% in AET, $X^2(4) = 18.55$, $p = .001$). No differences emerged in whether patients felt their treatment focused on the core of their problems or reported therapy strain.

## 3.2 | Exploration of long-term effects

Neither treatment had superior effects on anxiety at 6- or 12-month follow-up. Mean change in anxiety from baseline to 6-month follow-up was $M = -6.44$, $SD = 8.67$ for AET and $M = -4.90$, $SD = 4.92$ for CBT, $t(54) = -.83$, $p = .410$, $d_s = 0.22$; and from baseline to 12-month follow up, $M = -7.33$, $SD = 8.47$ for AET and $M = -4.60$, $SD = 5.12$ for CBT, $t(41) = -1.32$, $p = .195$, $d_s = 0.41$ (for details, see Tables S1–S8).

## 4 | DISCUSSION

This study compared the effectiveness of CBT for DSM-5 anxiety disorders to person-centered, transdiagnostic AET. Contrary to expectations, AET did not have broader effects than CBT, indicated by comparable change trajectories in general psychopathology, comorbid depression, quality of life, autonomy-connectedness, and self-esteem. Long-term effects and patient evaluations were also similar. As expected, the performance of AET with respect to anxiety reduction was highly comparable to CBT.

Our findings overall suggest that CBT and AET have similar effects on anxiety and comorbid psychopathology. Because our study was sufficiently powered to detect medium or larger effect sizes, our study more precisely suggests that any differences in effectiveness between AET and CBT are likely non-existent or small. These findings parallel earlier comparative trials in anxiety and depression, which typically find no or small differences in effectiveness between evidence-based therapies (Baardseth et al., 2013; Cuijpers, 2017; Marcus et al., 2014; Tolin, 2010). Both conditions had large within-subject effects on anxiety, psychopathology, and comorbid depression, comparable to other active treatment conditions in anxiety research, supporting the effectiveness of AET for DSM-5 anxiety

**TABLE 3** Effects of autonomy enhancing treatment versus cognitive behavioral therapy on primary outcome measures: Intention-to-treat (*n* = 129)

| | | Anxiety | | | | General psychopathology | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | B (SE) | t (p) | $d_{elta}$ (within) | | B (SE) | t (p) | $d_{elta}$ (within) | |
| I | Condition | 2.25 (1.49) | 1.51 (.145) | AET | CBT | 15.072 (9.56) | 1.58 (.127) | AET | CBT |
| | Pre to mid | **−3.23 (.51)** | **−6.28 (<.001)** | −0.35 | −0.37 | **−24.50 (3.32)** | **−7.37 (<.001)** | −0.40 | −0.42 |
| | Pre to post | **−6.80 (.64)** | **−10.60 (<.001)** | −0.75 | −0.81 | **−50.55 (4.41)** | **−11.48 (<.001)** | −0.84 | −0.89 |
| | Pre to 3mFU | **−6.25 (.76)** | **−8.27 (<.001)** | −0.89 | −0.65 | **−45.48 (4.87)** | **−9.34 (<.001)** | −0.96 | −0.76 |
| | | Δ−2LL, χ(4) = 81.69, p < .001 | | | | Δ−2LL, χ(4) = 92.27, p < .001 | | | |
| | | | | $d_{elta}$(between) | | | | $d_{elta}$(between) | |
| II | Pre to mid*cond | .10 (1.029) | .098 (.922) | 0.019 (C) | | 2.24 (6.65) | .34 (.736) | 0.018 (C) | |
| | Pre to post*cond | .34 (1.29) | .27 (.791) | 0.059 (C) | | 2.44 (8.82) | .28 (.783) | 0.049 (C) | |
| | Pre to 3mFU*cond | −1.02 (1.52) | −.673 (.503) | −0.24 (A) | | −2.98 (9.73) | −.31 (.760) | −0.20 (A) | |
| | | Δ−2LL, χ(3) = 2.024, p = .568 | | | | Δ−2LL, χ(3)= .74, p = .863 | | | |
| | | **Depressive symptoms** | | | | **Quality of life** | | | |
| | | B (SE) | t (p) | $d_{elta}$ (within) | | B (SE) | t (p) | $d_{elta}$ (within) | |
| I | Condition | 2.15 (1.53) | 1.40 (.163) | AET | CBT | −.40 (.32) | −1.22 (.232) | AET | CBT |
| | Pre to mid | **−4.63 (.72)** | **−6.48 (<.001)** | −0.48 | −0.38 | **.83 (.13)** | **6.60 (<.001)** | 0.54 | 0.31 |
| | Pre to post | **−9.12 (.95)** | **−9.57 (<.001)** | −0.86 | −0.86 | **1.42 (.15)** | **9.21 (<.001)** | 0.81 | 0.66 |
| | Pre to 3mFU | **−9.14 (.97)** | **−9.42 (<.001)** | −1.11 | −0.75 | **1.45 (.18)** | **8.067 (<.001)** | 0.93 | 0.63 |
| | | Δ−2LL, χ(4) = 76.56, p < .001 | | | | Δ−2LL, χ(4) = 69.54, p < .001 | | | |
| | | | | $d_{elta}$(between) | | | | $d_{elta}$(between) | |
| II | Pre to mid*cond | −.40 (1.43) | −.28 (.783) | −0.10 (A) | | .43 (.25) | 1.74 (.084) | 0.24 (A) | |
| | Pre to post*cond | .11 (1.91) | .058 (.954) | −0.0047 (A) | | .35 (.31) | 1.16 (.25) | 0.16 (A) | |
| | Pre to 3mFU*cond | −2.31 (1.92) | −1.20 (.232) | −0.37 (A) | | .40 (.36) | 1.12 (.27) | 0.31 (A) | |
| | | Δ−2LL, χ(3) = 3.32, p = .345 | | | | Δ−2LL, χ(3) = 3.088, p = .378 | | | |
| | | **Self-awareness** | | | | **Sensitivity to others** | | | |
| | | B (SE) | t (p) | $d_{elta}$ (within) | | B (SE) | t (p) | $d_{elta}$ (within) | |
| I | Condition | −.12 (.13) | −.95 (.344) | AET | CBT | .19 (.089) | 2.14 (.034) | AET | CBT |
| | Pre to mid | **.18 (.044)** | **4.049 (<.001)** | 0.27 | 0.12 | **−.078 (.033)** | **−2.35 (.021)** | −0.20 | −0.09 |
| | Pre to post | **.40 (.062)** | **6.44 (<.001)** | 0.43 | 0.32 | **−.22 (.036)** | **−6.15 (<.001)** | −0.47 | −0.40 |
| | Pre to 3mFU | **.50 (.083)** | **6.11 (<.001)** | 0.65 | 0.44 | **−.20 (.048)** | **−4.15 (<.001)** | −0.46 | −0.29 |
| | | Δ−2LL, χ(4) = 44.78, p < .001 | | | | Δ−2LL, χ(4) = 37.31, p < .001 | | | |
| | | | | $d_{elta}$(between) | | | | $d_{elta}$(between) | |
| II | Pre to mid*cond | .11 (.088) | 1.30 (.198) | 0.15 (A) | | −.018 (.067) | −.27 (.790) | −0.11 (A) | |
| | Pre to post*cond | .16 (.12) | 1.33 (.186) | 0.10 (A) | | −.040 (.072) | −.55 (.585) | −0.07 (A) | |
| | Pre to 3mFU*cond | .23 (.16) | 1.41 (.162) | 0.21 (A) | | −.069 (.095) | −.73 (.470) | −0.16 (A) | |
| | | Δ−2LL, χ(3) = 2.87, p = .412 | | | | Δ−2LL, χ(3) = .59, p = .906 | | | |
| | | **Capacity for managing new situations** | | | | **Self-esteem** | | | |
| | | B (SE) | t (p) | $d_{elta}$ (within) | | B (SE) | t (p) | $d_{elta}$ (within) | |
| I | Condition | .08 (.13) | .64 (.527) | AET | CBT | −.15 (.80) | −.19 (.855) | AET | CBT |
| | Pre to mid | **.13 (.049)** | **2.74 (.007)** | 0.35 | 0.09 | **1.35 (.35)** | **3.85 (<.001)** | 0.38 | 0.19 |
| | Pre to post | **.42 (.065)** | **6.45 (<.001)** | 0.67 | 0.51 | **3.14 (.46)** | **6.76 (<.001)** | 0.69 | 0.66 |
| | Pre to 3mFU | **.30 (.072)** | **4.24 (<.001)** | 0.54 | 0.26 | **3.47 (.54)** | **6.48 (<.001)** | 0.92 | 0.62 |

**TABLE 3** (Continued)

| | | Capacity for managing new situations | | | Self-esteem | | |
|---|---|---|---|---|---|---|---|
| | | B (SE) | t (p) | $d_{elta}$ (within) | B (SE) | t (p) | $d_{elta}$ (within) |
| | | $\Delta-2LL$, $\chi(4) = 37.072$, $p < .001$ | | | $\Delta-2LL$, $\chi(4) = 42.11$, $p < .001$ | | |
| | | | | $d_{elta}$(between) | | | $d_{elta}$(between) |
| II | Pre to mid*cond | .13 (.098) | 1.29 (.198) | 0.26 (A) | .81 (70) | 1.17 (.246) | 0.20 (A) |
| | Pre to post*cond | .11 (.13) | .87 (.385) | 0.15 (A) | .32 (.93) | .34 (.734) | 0.016 (A) |
| | Pre to 3mFU*cond | .20 (.14) | 1.40 (.166) | 0.28 (A) | .79 (1.066) | .75 (.458) | 0.30 (A) |
| | | $\Delta-2LL$, $\chi(3) = 2.32$, $p = .508$ | | | $\Delta-2LL$, $\chi(3) = 1.62$, $p = .656$ | | |

*Note*: 3mFU=3-month follow-up; Condition (cond) was coded 0=cognitive behavioral therapy and 1=autonomy enhancing treatment. $\Delta-2LL$ for model I was compared to the intercept only model. $d_{elta}$=Glass's delta, see Tables S1–S4. Directions of the between-subject effect sizes: "A" indicates more change in the AET group, "C" indicates more change in the CBT group.
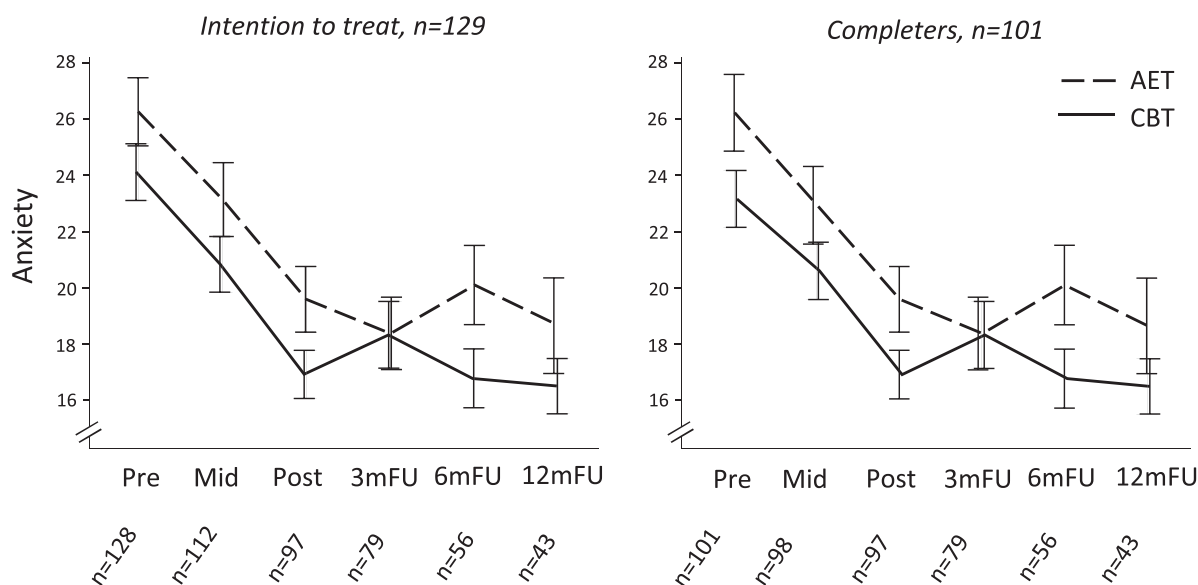


**FIGURE 2** Mean anxiety scores (±1 standard error) over time for autonomy enhancing treatment versus cognitive behavioral therapy. *Note*: None of the differences between AET and CBT at the timepoints were significant

disorders. Treatment response also did not vary by demographics, diagnosis, or prior CBT experience.

Our data did not support the hypothesis that AET has broader and longer-lasting effects than CBT. Both therapies maintained medium to large effects on anxiety, psychopathology, and comorbid depression after 3-, 6-, and 12-months. Although certain psychotherapies are proposed to have slower but longer-lasting effects, a recent meta-analysis found no evidence for the existence of this so-called "sleeper effect" (Podina et al., 2019). With respect to the "broader" outcomes, anxiety might be a core symptom in this population, which when changed, automatically affects related outcomes (Price et al., 2019). If differential effects between AET and CBT on measures such as quality of life exist, they are likely small.

Treatment effects on autonomy-connectedness and self-esteem (medium-large) were similar across conditions. Because AET, but not CBT, explicitly focuses on enhancing autonomy, this outcome raises questions on the working mechanisms of both therapies. Integrity

ratings revealed that the treatments were clearly distinct. Given the multifaceted, complex nature of psychopathology, psychotherapies most likely work through different mechanisms with reciprocal effects (Cuijpers et al., 2019). For instance, CBT for depression focuses on behavioral activation and cognitive restructuring, but thereby also affects relationship quality, and interpersonal psychotherapy (IPT) also affects activation and cognitions (Cuijpers et al., 2019). Similarly, autonomy enhancement in AET may contribute to later self-initiated exposure (through improved mastery and self-regulation), whereas cognitive restructuring in CBT may contribute to autonomy enhancement. AET may also share working mechanisms with IPT due to its interpersonal focus (Markowitz et al., 2014), and with acceptance and commitment therapy (ACT) due to encouragement of value-driven behavior (Arch & Craske, 2008). Because mechanism assessments in RCTs are insufficiently fine-grained to detect temporal developments and are typically insufficiently powered to detect small differences, working mechanisms of AET and CBT should be

elucidated in prospective dynamic change-process studies (Hofmann et al., 2020). Another promising venue for future research would be to assess in more detail individual differences in effectiveness of AET versus CBT.

With respect to limitations, we did not include a waitlist control condition out of ethical and feasibility considerations. Waitlist-controlled studies are recommended to replicate a pilot study on AET (Maas, van Balkom, et al., 2019) in a well-powered sample. Because our study was sufficiently powered to detect medium effects, we cannot rule out that small differences in effectiveness between AET and CBT may exist (David et al., 2018). As the present study was not a non-inferiority trial, we also do *not* conclude that AET and CBT have *equivalent* effects. High-quality trials with sample sizes in the current range are nevertheless highly valuable to rule out medium or larger differences, to inform and encourage the development of larger trials, and for inclusion meta-analytic research testing potential small differences between treatments, which cannot realistically be tested in single clinical studies (Cuijpers, 2016).

Furthermore, cluster-based randomization strategies have limitations over individual randomization when the number of sites is limited (e.g., environmental effects). Baseline scores in this sample were slightly elevated in the AET condition, and severe psychopathology can contribute to increased (more room to improve) or decreased (higher case complexity) treatment efficacy. Additionally, indications exist that group-based therapies are less effective than individual therapies for social anxiety disorder (Aderka, 2009; Carpenter et al., 2018; Mortberg et al., 2007; Sharp et al., 2004). Replication using individualized treatment and randomization is therefore recommended. It is also unclear whether therapy duration and setting (individual or group; inpatient or outpatient) affect the performance of AET versus CBT. However, indications exist that anxiety therapies over 15 sessions are not considerably more effective than shorter therapies (Knekt et al., 2017; Levy et al., 2020; Robinson et al., 2020) and this may apply to CBT as well as AET.

The sample included patients with comorbid anxiety or depressive disorders and patients with prior treatment experience (e.g., CBT), introducing heterogeneity. Prior CBT can sometimes attenuate treatment response (Delsignore, 2008), but in the present trial, we found no indications that prior CBT experience affected treatment response or differential responses to AET versus CBT. Considering the high comorbidity rates (Lamers et al., 2011) and chronicity (Batelaan et al., 2014) of anxiety disorders, the inclusion of patients with comorbidity and prior treatment experience improves the external validity of the findings. Despite these efforts, caution in generalization to all anxiety patients is warranted, as our RCT included patients who essentially agreed to AET as well as CBT. As in all clinical trials, self-selection effects may therefore have occurred, where patients who recognize autonomy deficits may be overrepresented in our sample. Although the sample was "average" in anxiety severity compared with psychiatric populations (Arrindell & Ettema, 1975, 2005), very severe cases may be underrepresented, due to the group-based intervention and the restrictions on medication changes. Few patients with a non-Dutch ethnic background participated, limiting generalizability to more diverse populations.

# 5 | CONCLUSION

The present study was the first clinical randomized trial to directly compare AET to CBT. The findings lend further support for the effectiveness of AET and suggest the similar performance of AET and CBT for DSM-5 anxiety disorders. Larger studies and non-inferiority trials may shed light on potential small differences in the effects of AET versus CBT. The additive value of AET does not seem to lie in enhanced effectiveness on more global outcomes or on the long-term, but availability of this more person-centered and transdiagnostic therapy can extend treatment options for anxiety disorders, which are currently limited. The results extend the limited number of comparative trials on anxiety disorders (Baardseth et al., 2013; Tolin, 2014) thereby answering a call for more diverse anxiety treatments that may attract patients otherwise refusing psychological treatment (Goetter et al., 2020).

## CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

## ETHICS STATEMENT

The study was approved by the Medical Ethics Committee Brabant (NL60593.028.17) and all participants signed for informed consent.

The trial was preregistered at the Dutch Clinical Trial Registry (https://www.trialregister.nl/trial/6250).

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