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Facing social anxiety and avoidant personality disorder

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Chapter 4

Group schema therapy versus group cognitive behavioral therapy for patients with social anxiety disorder and comorbid avoidant personality disorder: a randomized controlled trial

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ABSTRACT

Background

Patients with social anxiety (SAD) and comorbid avoidant personality disorder (AVPD) are severely impaired. Group cognitive behavioral therapy (GCBT) is considered an effective treatment for SAD. More knowledge on treatment of SAD with comorbid AVPD is needed. Schema therapy, developed for personality and chronic mental disorders, may be a promising treatment.

Methods

We conducted a randomized controlled trial in an outpatient population (n = 154) with both SAD and AVPD. Group Schema Therapy (GST) and GCBT were compared on SAD symptoms (Liebowitz Social Anxiety Scale) and manifestations of AVPD (Avoidant Personality Disorder Severity Index).

Results

Intention-to-treat analysis showed no significant differences between treatments at 3 months post-treatment and one-year follow-up. Both modalities led to significant and substantial improvements. No significant between-differences were found in depressive symptoms (Inventory of Depressive Symptoms) and quality of life (World Health Organization Quality of Life-BREF). Per-protocol analysis showed similar outcomes and no significant differences in recovery from SAD and AVPD. Significantly more patients completed GST.

Conclusion

GST and GCBT are valuable treatments for SAD with comorbid AVPD. The higher treatment retention in ST indicates ST is more acceptable than GCBT. Future studies should focus on enhancing treatment effects and improving retention to GCBT.

INTRODUCTION

Both social anxiety disorder (SAD) and avoidant personality disorder (AVPD) are characterized by avoidance and substantial impairments and associated with social isolation and reduced quality of life (Fehm et al., 2008, Simonsen et al., 2019, Steinert et al., 2013, Wilberg et al., 2009). Patients with SAD experience persistent fear of humiliation in social situations with unfamiliar people or when at risk of possible scrutiny. They either avoid or endure these situations with intense anxiety and distress (APA, 2000, APA, 2013). Patients with AVPD are characterized by a pervasive pattern of social inhibition, feelings of inadequacy, hypersensitivity to negative evaluation, and fear of rejection that starts in early adulthood and is present in a variety of contexts (APA, 2000, 2013; Eikenæs et al., 2006). People with SAD and AVPD are often reluctant to seek treatment unless strained by comorbid disorders (Lecrubier et al., 2000, Weiller et al., 1996). Treatment compliance may be impeded by anxiety, sensitivity to rejection, and avoidance (Hope et al., 1995; Van & Kool, 2020). Lifetime and community estimates of SAD and AVPD range respectively between 7–13% (Steinert et al., 2013) and 1.5–2.5% (Lampe et al., 2003). Estimates of comorbidity of AVPD in SAD range from 50 to 89% (Cox et al., 2009).

The difference between SAD and AVPD has been the subject of debate, with, on the one hand, the view of AVPD as a severe variant of SAD and on the other hand, as a distinct diagnostic disorder (Lampe & Malhi, 2018). DSM-5 retained both disorders as distinct. AVPD is considered a well-validated disorder with enough clinically significant symptoms to warrant clinical attention and treatment (Reich, 2014) involving more severe and broader areas of personality dysfunction than SAD. The dysfunction and subjective distress are comparable to that of borderline personality disorder (BPD) (Eikenæs et al., 2013, Wilberg et al., 2009). Comorbid SAD and AVPD is associated with more severe social anxiety symptoms (Cox et al., 2009, Van Velzen et al., 2000). Given the abovementioned views, one might ask whether patients with both diagnoses would benefit more from a treatment approach from a symptom or personality disorder perspective.

Cognitive Behavioral Therapy (CBT) is considered to be an effective treatment for patients with SAD (Leichsenring & Leweke, 2017). It has the most robust evidence base compared with other psychotherapies for SAD (Mayo-Wilson et al., 2014). In a meta-analysis on treatments for SAD, Mayo-Wilson et al. (2014) found CBT in a group format almost as effective as individual CBT. A well-known effective group CBT therapy was developed by Heimberg and colleagues (Heimberg & Becker, 2002).

Most empirical knowledge with respect to the treatment of AVPD is derived from studies of CBT directed at SAD as primary complaint, reporting outcomes for SAD with and without AVPD (see Lampe and Malhi, 2018 for a review). Available studies give mixed findings on the effect of comorbid AVPD on treatment outcome varying from no effect on outcome to an increased risk of persistent symptoms of SAD, less

likelihood of remission from SAD, and failure to reach normative levels of functioning. Moreover, these studies support the value of cognitive behavioral approaches in relieving symptoms of AVPD to at least some extent (Lampe & Malhi, 2018). When designing this RCT, Dutch guidelines specified that in case of comorbidity of SAD and AVPD, CBT is seen as an adequate treatment option, although prolonged treatment is necessary to realize comparable favourable outcomes as for SAD only (Trimbos Instituut, 2008). Although no main goal of this RCT, offering patients with both SAD and AVPD an extended CBT treatment of more sessions than usually applied when only treating SAD, will inform us if an extended form of CBT positively impacts outcomes with respect to reaching normative levels of functioning, and on its impact on persistency and likelihood of remission. Few studies have been performed on the treatment of AVPD specifically (Simonsen et al., 2019, Weinbrecht et al., 2016). These studies were generally small and differed in modality, format, duration, sample size, and (follow-up) measures. In his overview, Simonsen et al. (2019) described four RCTs on psychotherapy for AVPD, two investigating CBT. Alden (1989) compared four 10-week conditions: CBT, CBT with interpersonal skills training, CBT with intimacy focus, and waitlist. Emmelkamp et al., (2006) compared 20 sessions of CBT, brief dynamic therapy, and waitlist. Both studies showed significantly more improvement in CBT compared to the waiting-list control group on several measures. Offering CBT seems an obvious approach for patients with both SAD and AVPD, especially when AVPD is seen as a severe form of SAD since CBT is considered the golden standard for the latter.

To extend the knowledge on the treatment of SAD comorbid with AVPD, it would be interesting to investigate Schema Therapy (ST). ST evolved as one of the major current treatments for patients with PDs and chronic mental health problems. Young et al. (2003) developed ST to solve potential pitfalls of CBT for those patients who did not respond fully to treatment.

ST assumes that aversive experiences and frustration of basic childhood needs, in interaction with biological and cultural factors, lead to the development of maladaptive schema and resulting emotional, cognitive, and behavioral states, called schema modes. PD patients, including those with AVPD, are characterized by rigid patterns of thinking and difficulties accessing, recognizing, and expressing cognitions and emotions. In response to aversive life experiences, they learned to suppress and avoid emotions and other inner experiences. This tendency can negatively affect the willingness and ability to engage in CBT procedures and homework, such as exposure to fearful stimuli and reporting thoughts and feelings. Their difficulties in relating to others negatively influence forming a collaborative relationship with a therapist (Fassbinder & Arntz, 2021; Young et al., 2003). Shortcomings in establishing interpersonal relationships and severe feelings of inadequacy are seen as cardinal features of AVPD (Bögels et al., 2010, Weinbrecht et al., 2016).

To address the aforementioned issues, Young et al. (2003) integrated ideas and techniques of different theoretical orientations (e.g., CBT, attachment theory,

psychodynamic and experiential therapies). In ST more emphasis is placed on exploring the origin of problems in childhood and adolescence, the patient-therapist relationship, and maladaptive coping styles (Young et al., 2003). In addition to cognitive and behavior-oriented techniques, ST extensively uses experiential techniques to process memories of traumatization and unmet childhood needs (Fassbinder & Arntz, 2021) that may underlie feelings of inadequacy. The therapeutic relationship is conceptualized as limited reparenting and serves as an antidote to adverse interpersonal experiences (Young et al., 2003). Modern ST works almost exclusively with the schema mode model (Fassbinder & Arntz, 2021). It provides therapists with a theoretical framework and specific mode models for AVPD. This makes patients' complex problems relatively easily understandable in terms of schema modes and to apply techniques specifically developed for these modes (Arntz, 2012). Patients learn to understand their emotional needs, minimize maladaptive modes, and strengthen healthy modes, thereby changing dysfunctional patterns that cause problems in adult life (Farrell & Shaw, 2012) and learning adaptive ways of getting their needs met. ST has proven efficacious for BPD (Arntz et al., 2022, Farrell et al., 2009, Giesen-Bloo et al., 2006, Masley et al., 2012, Nadort et al., 2009). Randomized studies, specifically on ST for AVPD, are lacking. However, Bamelis et al. (2014) examined ST in a large mixed personality disorder (PD) sample that included 51% AVPD patients. ST was found to be superior, compared with treatment as usual (TAU) and clarification-oriented psychotherapy, on recovery of PD, and this also held for the AVPD subsample ($N = 163$). Patients might respond to ST because it addresses early maladaptive schema thought to maintain their disorder (Peeters et al., 2022). When AVPD is present at the start of treatment, patients are less likely to remit from SAD, more likely to have a new episode of SAD compared with those without AVPD and will suffer from more prolonged episodes of SAD (Ansell et al., 2011). Applying ST to patients with both diagnoses can be a promising approach, especially from the perspective of conceptualizing AVPD as a PD and distinct from SAD.

Group CBT (GCBT) is frequently applied in the treatment of SAD (Mayo-Wilson et al., 2014). Compared to individual treatment, group treatment enables larger numbers to be treated, if similarly effective, thereby contributing to efficiency in health care (Bachrach & Arntz, 2021). Groups can provide a curative context for addressing the interpersonal problems of PD patients (Burlingame et al., 2016). Being part of a group provides patients with positive experiences through sharing with others and mutual support. Contact with others with similar problems, reducing the sense of isolation and feeling different, are positive effects (Alden, 1989). A group-only format might encourage patients to bring all issues to the group, thereby optimizing group therapeutic processes (Arntz et al., 2022), especially with avoidant patients who would otherwise be inclined not to share anything during group meetings. Farrell and Shaw (2012) developed a group format for ST. In an RCT, the addition of 30 group sessions to TAU showed higher BPD remission rates and lower dropout than TAU

alone (Farrell et al., 2009). GST combined with individual ST shows positive results concerning BPD symptoms, quality of life, and dropout (Arntz et al., 2022, Fassbinder and Arntz, 2021). Adequately powered RCTs into the effectiveness of GST for AVPD are needed (Bachrach & Arntz, 2021).

The current study aims to further the knowledge with respect to group treatment for patients with both SAD and AVPD. In general, optimal treatment, length, and modality for the treatment of AVPD still have to be empirically established (Lampe & Malhi, 2018). Based on the promising results of ST for PDs, we designed a superiority trial to compare the effectiveness of GST and GCBT for SAD comorbid with AVPD.

METHODS

A design article offers a detailed description of the methods (Baljé et al., 2016) of this randomized controlled superiority trial. Either GST or GCBT was offered to eligible participants with both SAD and AVPD as principal diagnoses (according to both patient and clinician) and assessed with respectively the Mini-International Neuropsychiatric Interview (MINI; (Sheehan et al., 1998)) and Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II; (First et al., 1997)). The trial was conducted at two anxiety departments (The Hague, Rotterdam) of a Dutch specialized mental health care institution (PsyQ). Additional inclusion criteria were age 18 to 65; motivation and ability to partake in sessions, homework, and assessments; refraining from alternative treatments; and antidepressant medication being stable for the last three months and not increasing the dose or changing the type of antidepressants during treatment. To minimize the immediate need for alternative specialized treatment, patients with acute suicidality, psychotic or bipolar symptoms, autism, estimated IQ below 80, lack of mastery of the Dutch language, substance use, or dependence needing detoxification were excluded.

The study was designed to detect a difference in outcome with a medium effect size (0.50) with a power of 80% and a two-tailed alpha set at 0.05. A power analysis indicated a minimum of 128 patients. We included 154 participants to compensate for study dropouts. To realize the necessary influx, the study was promoted among other locations of PsyQ, mental care providers, and on websites for social anxiety patients and in local newspapers, and the beforehand planned inclusion period was extended.

All participants provided online informed consent. After completion of baseline assessments, patients were randomized per site by an independent research assistant using a computer-generated list (<https://www.random.org/lists/>), after which patients were informed about their treatment allocation. Participants were mainly randomized in pairs or multiples of pairs (or extremely rarely, in odd numbers), as randomization in even numbers (block randomization, 1:1) resulted in proportional allocation to both conditions.

Main researchers were blind to group assignment and assessment results. Patients and therapists in both conditions were not blinded to treatment condition. To prevent potential bias, group therapists were not involved in data collection. Data collectors were not informed of the allocated treatment condition, but being employed as psychologists at the research site in The Hague, blindness could not be fully guaranteed.

This RCT was registered with the Netherlands Trial Registry, number NTR3921 in 2013. Ethical approval was received from the Medical Ethical Committee of the Leiden University Medical Centre (LUMC), the Netherlands (protocol number p12.165). The Avoidant Personality Disorder Severity Index (AVPDSI) was added as primary measure shortly after the inclusion started; the MINI and SCID-II became secondary measures, consistent with the description in the published study protocol (Baljé et al., 2016) and adjusted in the trial registration. This study followed the Consolidated Standards of Reporting Trials (CONSORT) reporting guideline (see supplementary Table A1).

Outcome measures

Primary outcome measures were the severity of SAD and AVPD as reflected in the participants scores on the self-report version of the Liebowitz Social Anxiety Scale (LSAS-SR; (Liebowitz, 1987)) and the newly developed Avoidant Personality Disorder Severity Index (AVPDSI) interview (Baljé et al., 2023), respectively. Secondary outcome measures were depressive symptoms (IDS; Rush et al., 1996), quality of life (WHOQOL-BREF; (de Vries & van Heck, 1996, WHOQOL Group, 1998)) and the presence of SAD (MINI) and AVPD (SCID-II) at 12-month follow-up. At baseline, information was gathered on sociodemographic characteristics. Results on childhood trauma, self-esteem, emotion regulation, schema modes, and experiential avoidance were used for mediation and moderator analysis and will be reported elsewhere.

Self-report measures (LSAS, IDS, WHOQOL-BREF) were administered online at baseline; after 15 and 30 treatment sessions; and three, six, and twelve months after treatment. Clinician-rated measures were administered at baseline (SCID-II, MINI, AVPDSI) and at three (AVPDSI) and twelve-month follow-up (AVPDSI, MINI: SAD section, SCID: AVPD section).

Psychometric properties of all applied instruments are described in the study protocol article (Baljé et al., 2016) except for the, for this RCT, newly developed AVPDSI. In a recent psychometric study, the AVPDSI showed excellent internal reliability, interrater-agreement, and validity (Baljé et al., 2023).

Interventions and treatment integrity

Treatment was offered in a semi-open-group format to limit waiting time for patients. It consisted of thirty weekly ninety-minute sessions preceded by two introductory

individual sessions and followed by a three-month treatment-free period (after which patients could receive additional treatment if indicated). Group treatment was divided into three phases of ten sessions. In every first session of each phase, new members were welcomed. In every tenth session, members who completed three phases left. Attendance of at least 80% of the sessions was required, and patients were informed beforehand that too much absence would lead to treatment termination. When necessary, individual contact, initiated by either the patient or therapist (in person, by phone, or by email), was permitted to a maximum of 180 min.

Existing treatment protocols were adapted for both conditions to equalize treatment time and fit the semi-open group format. For GCBT, this was based on the group CBT protocol for SAD (Heimberg & Becker, 2002) and more recent insights into working mechanisms of exposure in vivo (Craske et al., 2014). For GST it was based on the treatment method of GST for borderline personality disorder (BPD) as developed by Farrell and colleagues (2012, 2014). The GCBT sessions essentially consisted of exposure to feared situations and cognitive restructuring. Besides focusing on dysfunctional thoughts throughout all the sessions, one of the three phases additionally addressed cognitive distortions, and another phase additionally addressed core beliefs. Patients could start in any of the three phases, depending on when they entered the group. In GST, participants went each through three successive 10-week phases: junior, medior and senior. The techniques applied in the sessions varied in depth, and, like the homework, were adapted to each phase. Both modalities are described in detail in Table 1.

Both treatments were offered by experienced therapists. A pilot period was utilized to gain experience with the protocols and semi-open group format. Therapists of the ST group received a 2-day formal training in GST and were supervised during the trial by Farrell and Shaw. GCBT is a regular treatment in the involved anxiety departments. GCBT therapists were supervised by two experienced clinicians specialized in GCBT for anxiety disorders, who also provided a one-day training on the abovementioned SAD protocol. With two participating sites and two therapists per group, each modality involved four therapists. Due to job changes, both treatment conditions faced two replacements during the study.

Supervision (1.5 hours a month) served educational purposes, and treatment integrity and competence monitoring. The latter was investigated after the trial ended. Using stratified block randomization to equally represent sites and treatments, 84 audio recordings of GCBT and GST sessions were selected (around 20% (Perepletchikova, 2011, Schlosser, 2002)), for each block of 10 sessions, using a random number generator (<https://www.random.org/lists/>). Missings (25%) due to technical/organizational reasons were evenly distributed between the two modalities.

A checklist to assess treatment integrity and interrater reliability was developed for both modalities based on treatment protocols and the following criteria: inclusion of essential elements, exclusion of prohibited techniques, and suitability for assessments of audio recordings and rating by non-experts. GST items were partly

Table 1 Description of group cognitive behavioral therapy and group schema therapy

GROUP COGNITIVE BEHAVIORAL THERAPY	GROUP SCHEMA THERAPY
▪ Gold standard for psychological treatment of SAD ▪ Exposure to feared situations and cognitive restructuring ▪ Fear of social situations is central ▪ Social anxiety is a learned response to social situations incorporating interactive physiological, behavioral, and cognitive features based on expectancies such as humiliation and rejection by others or by confrontation with own social inadequacies and failure ▪ The goal is the reduction of social anxiety symptoms by disconfirming dysfunctional expectancies and forming new associations. Exposure sets off a process of inhibition in which the association of the conditioned stimulus (CS; social situations) and the feared unconditioned stimulus (US; humiliation) is inhibited by the forming of new associations around the CS, of which the association with 'no-US' (no rejection) is probably the most important ▪ The group serves as an immediate exposure setting while at the same time offering the possibility of vicarious learning. ▪ Group sessions are highly structured and follow the same agenda: discussing homework assignments, in-session performance-based exposure followed by discussing differences between expected and actual outcomes, and assignment of new homework. ▪ Individual introductory sessions: Information about the content of GCBT, the role of avoidance and safety-seeking, and the basics of cognitive restructuring List of feared situations Individual case conceptualization ▪ Homework: exposure to form new non-anxious associations and experience that negative consequences do not come true in reality	▪ Treatment for personality disorders, originally developed for BPD ▪ Experiential, cognitive, and behavioral techniques addressing childhood and present ▪ Schema modes, emotions, and needs are central ▪ Modes are specific states that occur as result of activated schema and type of coping. Schemas develop due to childhood and adolescence experiences, when basic needs are not met or as a consequence of trauma, and result in maladaptive strategies and patterns. ▪ The goal is to enable patients to get their emotional needs met and form healthy social relationships by reducing the use of dysfunctional coping modes, healing maladaptive child modes, banishing internalized parent modes, and strengthening the adaptive modes. Through experiential, cognitive, and behavioral interventions, awareness of modes is created, and patients learn healthier ways to cope with emotions and needs. ▪ The group functions as a family with members as 'siblings' and therapists as 'parents'; catalyzes ST techniques: cohesion, validation, emphatic confrontation, and limited reparenting. ▪ Group sessions highlight specific modes in fixed order. Elements covered for each mode are: education, experiential exercises, and cognitive and behavioral techniques. Experiences with homework assignments are discussed, and new homework is introduced. ▪ Individual introductory sessions: Information on content and process of GST Discuss briefly the results of SMI Formulate case conceptualization in schema mode terms in collaboration with the patient ▪ Homework: aims at an awareness of modes and needs and at creating corrective emotional experiences and reducing dysfunctional modes

based on some (combined) items of the Group schema therapy rating scale-revised (Zarbock et al., 2014). After a brief training on treatment approaches and scoring, three psychologists and three master's students in clinical psychology assessed recordings of selected sessions. Blinded second-raters scored 32 audiotapes. Criteria for adherence were rated present or absent and for competence from one ('weak') to six ('excellent') on a 6-point Likert-type scale (see Table 2). Raters were independent of the study and masked to treatment outcome.

Table 2 Treatment integrity criteria per condition for competence and adherence

Group cognitive behavioral therapy	Group schema therapy
• Exposure; • Cognitive restructuring; • Group climate; • Homework; • Structure; • Cognitive model education (every 1st session of each phase); • Percentage of time allocated to exposure^a • Prohibited techniques (e.g., mindfulness)^b	• Limited reparenting; • Schema therapy education; • Group dynamics; • Mode awareness; • Mode management; • Cognitive interventions; • Experiential interventions; • Behavioral pattern breaking interventions; • Homework; • Prohibited techniques (e.g., exposure)^b

^a % of time; ^b only adherence is rated.

STATISTICAL ANALYSIS

Analyses were carried out using R 4.1.0 (R Core Team, 2021), using the nlme package for the multilevel models (Pinheiro et al., 2022). Analyses were performed according to an intention-to-treat (ITT) strategy primarily and a per-protocol (PP) strategy secondarily. Between groups effect sizes were calculated by first computing change scores for the estimated means by subtracting the estimated baseline score from each of the estimated follow-up scores for each condition. Next, between group effect sizes were calculated by dividing the difference of these change scores between conditions by the sample standard deviation (SD) of the pretest scores (Feingold, 2009, Feingold, 2013). Cohen's *d* (Cohen, 1988) was used for within group effect sizes, with the numerator based on the difference in estimated means from the multilevel analyses and the denominator on the baseline SD of the ITT sample.

Intention-to-treat analysis

Multilevel analyses, including all randomized participants, were used to assess whether CBT and ST had different time effects for AVPDSI, LSAS, IDS, and WHOQOL-BREF. The fixed part of the model consisted of the condition and time

variables and their interaction, treating time as a categorical variable with baseline as the reference category. The stochastic part of the model had either a random intercept and a random slope for time at the patient level with an unstructured covariance matrix (i.e., a mixed model) or an imposed covariance structure on the residuals (i.e., a covariance pattern model) (Jennrich & Schluchter, 1986). The pattern model was used when the mixed model could not be fit, using a likelihood ratio test to choose between a first-order and a heterogeneous autoregressive covariance structure. Estimated marginal means were derived from the models.

Per-protocol analyses

Multilevel analyses were repeated in the per-protocol sample consisting of patients who attended ≥ 24 group sessions and refrained, during treatment and break, from starting/increasing or changing the type of medication and initiating other psychological treatments.

Clinical significant and reliable change

Clinical significant change was calculated for the LSAS and AVPDSI in participants completing follow-up assessments (T3, T5) using the methods described in Jacobson & Truax, (1991). Symptom improvement was indicated by a reliable change index (RCI) below -1.96 ; recovery by scoring below cut-off (LSAS score: 35 (von Glischinski et al., 2018); AVPDSI score: 37 (Baljé et al., 2023)), meeting both criteria indicated clinical significant change. The association between treatment condition and SAD/AVPD diagnosis at T5 was investigated using odds ratios.

Treatment integrity and treatment attrition

Treatment integrity was assessed using Gwet's agreement coefficients: Gwet's AC1 with linear weights for adherence and Gwet's AC2 with quadratic weights for competence, respectively, taking into account the nominal and ordinal character of the ratings. These coefficients are well-suited when there is high agreement among raters (Gwet, 2008). Cox regression was used to analyze differences in the time to attrition. Odds ratios were calculated to assess the association between treatment condition and attrition.

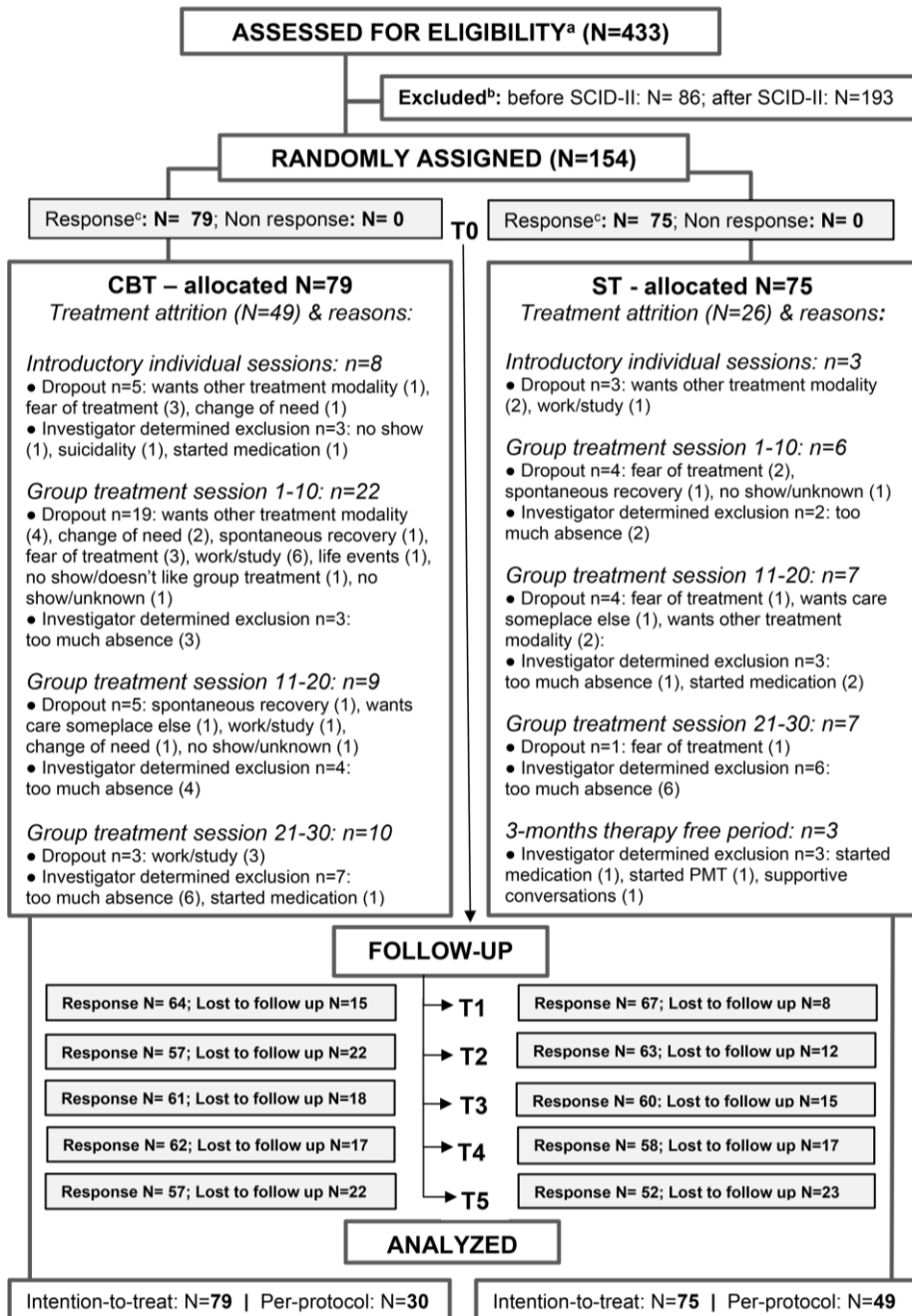


Figure 1. Consort diagram of participant flow. Note: ^a Main diagnosis of SAD; ^b The Hague site N=173: Before/after SCID II: 50/123 Reasons: no AVPD unknown/75; other main diagnosis 17/10; (suspected) autism 4/4; alcohol detox needed 1/1; low IQ 1/6; not available during sessions 5/9; not willing/motivated 5/13; started medication 0/1; wants treatment elsewhere 0/2; moved house 1/2, renouncing treatment 6/0; unreachable 7/0; bipolar 1/0, psychotic 1/0, suicidality 1/0. Rotterdam site N=106, reasons unknown; ^c Response LSAS. Response AVPDSI: T0 CBT 75, ST 71; T3 CBT 59, ST 55; and T5 CBT 50, ST 48. T1= after 15 sessions; T2= after 30 sessions; T3, T4, T5= respectively 3, 6 12, months after treatment

Table 3 Sociodemographic and Clinical Characteristics of 154 Study Participants

Characteristic	Group Cognitive Behavioral Therapy (N=79)		Group Schema Therapy (N=75)	
	Mean	SD	Mean	SD
Age (years)	30.6	8.6	29.3	8.8
	N	%	N	%
Sex: female ¹	41	51.9	39	52.0
Education level ²				
Low	5	6.3	5	6.7
Medium	28	35.4	30	40.0
High	16	20.3	22	29.3
Advanced	30	38.0	18	24.0
Employment status				
Housewife	1	1.3	4	5.3
Student	21	26.6	20	26.7
Employed	28	35.4	25	33.3
Disability – temporary	3	3.8	3	4.0
Disability	3	3.8	5	6.7
Welfare/unemployed	23	29.1	18	24.0
Anxiety disorders other than SAD				
no other anxiety disorders	43	54.4	38	50.7
one other anxiety disorder	25	31.6	25	33.3
two other anxiety disorders	7	8.9	8	10.7
three other anxiety disorders	4	5.1	4	5.3
Other axis-I disorders				
Depressive disorders	32	40.5	35	46.7
Substance use disorders	9	11.4	4	5.3
Eating disorders	3	3.8	0	0
ADHD	6	7.6	4	5.3
Personality disorders other than AVPD	6	7.6	1	1.3
Medication use at baseline:				
No medication	59	74.7	48	64.0
Sleeping and/or sedative drugs	2	2.5	3	4.0
Antidepressants (AD)	14	17.7	16	21.3
AD & sleeping/sedative drugs	3	3.8	7	9.3
Other	1	1.3	1	1.3
Medication use in past 3 years				
No medication	43	54.4	33	44.0
Sleeping and/or sedative drugs	5	6.3	11	14.7
Antidepressants (AD)	19	24.1	16	21.3
AD & sleeping and/or sedatives	8	10.1	14	18.7
Other	4	5.1	1	1.3
Psychological treatment in past 3 years	53	67.1	57	76.0

Table 3 Sociodemographic and Clinical Characteristics of 154 Study Participants (continued)

Characteristic	Group Cognitive Behavioral Therapy (N=79)		Group Schema Therapy (N=75)	
	Mean	SD	Mean	SD
Number of sessions in the past 3 years				
None	27	34.2	18	24.0
1-5	4	5.1	6	8.0
6-10	6	7.6	8	10.7
11-20	10	12.7	14	18.7
More than 20	32	40.5	29	38.7
Last completed treatment for				
Anxiety	14	17.7	13	17.3
Depression	4	5.1	5	6.7
Combination anxiety & depression	27	34.2	34	45.3
Other psychological problems	8	10.1	5	6.7
Not applicable	26	32.9	18	24.0
Mean credibility score CBT	6.1	1.5	6.0	1.6
Mean credibility score ST	6.3	1.4	6.2	1.5

¹ sex as indicated by self-report, ² education levels: low (BO, LBO) = primary school and lower vocational education; medium (MAVO, MBO) = lower secondary education and intermediate vocational education; high (HAVO, VWO) = higher secondary/pre-university education; advanced (HBO, WO) = higher vocational & academic education

RESULTS

Patient flow

In total, 433 patients with a primary diagnosis of SAD were assessed for eligibility. Of those assessed for PDs with the SCID-II, in 61.7% no comorbid AVPD diagnosis was present. At the two sites, 154 patients were enrolled and randomly assigned to GCBT and GST. Patient flow is presented in the Consort diagram (Figure 1). Examination of participant characteristics (see Table 3) revealed no salient differences between both modalities. Treatments were offered from March 2013 to December 2017 at one site (The Hague, $n = 95$) and from May 2014 till February 2018 at the other site (Rotterdam, $n = 59$). One adverse event was reported in the CBT condition. A patient became suicidal and contacted PsyQ. Suicidality was addressed in individual appointments, no harm occurred.

Treatment attrition

A total of 79 patients completed treatment according to the treatment protocol: 30 GCBT patients and 49 GST patients. Treatment attrition in GCBT was larger than in GST, respectively 49 (62.0%) and 26 (34.7%) patients. Attrition resulted from dropout

on behalf of the patient (GCBT 32; GST 12) or protocol violation (GCBT 17, GST 14). Missing too many sessions (>6) was the main reason for protocol violation. Information per modality on numbers, attrition phase, and causes is presented in the Consort diagram (Figure 1). Cox regression showed that patients in GST had a significantly lower attrition rate (Figure 2) compared to CBT ($b = -0.91$, $p < .001$; $HR = 0.40$, 95% $CI = 0.25$; 0.65) and had a higher odds of completing treatment than those in the CBT group ($OR = 3.08$, 95% $CI = 1.59$; 5.94). Within CBT, further analyses did not show that patients discontinued treatment because they had recovered (see supplementary material, Figure A1, Table 5a & 5b).

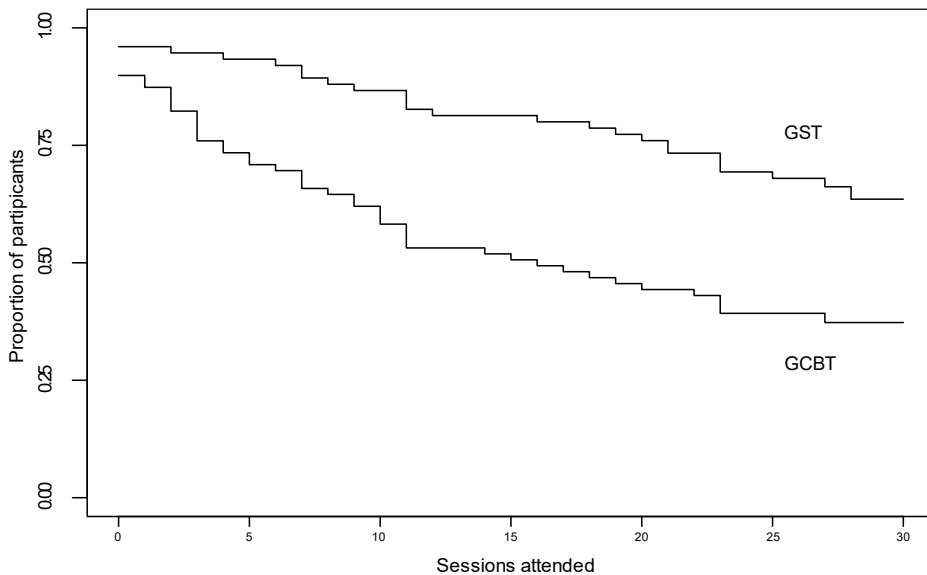


Figure 2. Survival curves for Group Schema Therapy (GST) and Group Cognitive Behavioral Therapy (GCBT).

Treatment integrity

Based on 42 randomly selected audiotapes per modality, both conditions showed excellent adherence to the prescribed methods and techniques (GCBT median=100%, GST median=100%). Median competence levels for applying these methods and techniques were good ('4') to very good ('5') for GCBT (median = 4.6, range: 4.0–5.2); and for GST (median = 4.6, range: 3.9–5.1).¹ No prohibited techniques were observed. In GCBT the median percentage of time spent on exposure was 72.64 (range: 50–90 min).

Interrater reliability of treatment integrity indicated almost perfect interrater agreement for both modalities concerning adherence (GCBT: $AC1 = 1.0$ (SE n.a.); GST: $AC1 = 0.90$ (SE =0.03)) and competence ratings of GCBT ($AC2 = 0.83$ (SE =0.03)). GST competence ratings indicated substantial agreement ($AC2 = 0.61$ (SE =0.06)).

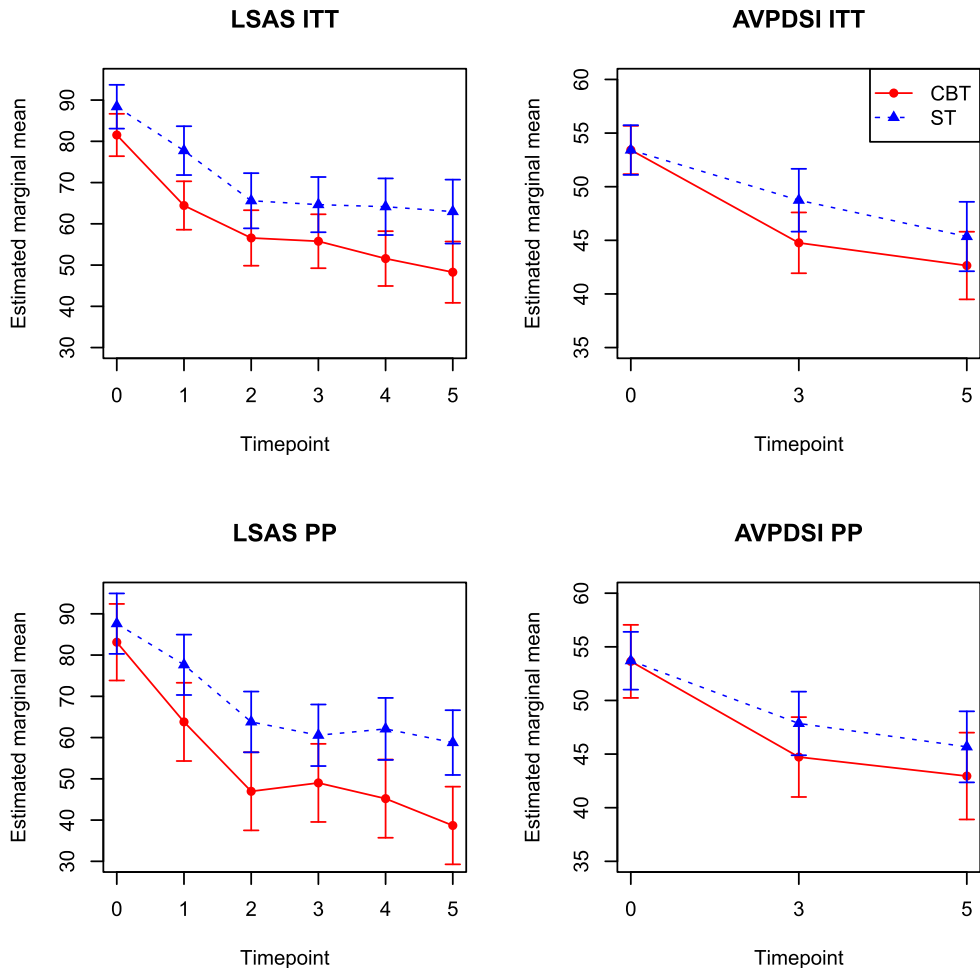


Figure 3. Estimated mean LSAS and AVPDSI scores over time in both groups, intention-to-treat and per-protocol analyses. Note: Error bars show 95% CI. LSAS= Liebowitz social anxiety scale, AVPDSI=avoidant personality disorder severity index, ITT = intention-to-treat, PP = per-protocol.

Treatment outcomes

In the ITT sample, no significant interaction between time and condition was found for the LSAS and AVPDSI (see Figure 3, Table 4, and supplementary Table A2). In both modalities, time had a significant effect on all outcomes.

Between group effect sizes for GCBT versus GST for the LSAS at T3 were 0.09 (95% CI [-0.23;0.41]) and at T5 0.35, (95% CI [0.03;0.68]). For the AVPDSI they were respectively 0.40 (95% CI [0.07;0.74]) and 0.28 (95% CI [-0.06;0.61]). Within group effect sizes for the LSAS were 1.16 at T3 and 1.50 at T5 for GCBT and 1.07 at T3 and 1.14 at T5 for GST. For the AVPDSI, these were respectively 0.88 and 1.10

for GCBT and 0.48 and 0.82 for GST. With regard to the secondary measures, the IDS and the WHOQOL, both treatment groups also did not evolve differently, and a significant effect for time was found for both GCBT and GST (see supplementary Table A3 & A4).

Table 4 Estimated means and within-group effect sizes LSAS and AVPDSI per condition

Measure	T0 EM [CI]	T3 EM [CI]	T5 EM [CI]	T0-T3 d ^w [CI]	T0-T5 d ^w [CI]
Intention-to-treat sample					
LSAS					
GCBT	81.53 [76.4;86.7]	55.78 [49.2;62.3]	48.27 [40.9;55.7]	1.16 [0.9;1.5]	1.50 [1.2;1.8]
GST	88.39 [83.1;93.7]	64.65 [58.0;71.4]	62.97 [55.2;70.7]	1.07 [0.8;1.4]	1.14 [0.9;1.4]
AVPDSI					
GCBT	53.42 [51.2;55.7]	44.77 [41.9;47.6]	42.65 [39.5;45.8]	0.88 [0.6;1.2]	1.10 [0.8;1.4]
GST	53.42 [51.1;55.7]	48.74 [45.8;51.7]	45.35 [42.1;48.6]	0.48 [0.2;0.7]	0.82 [0.6;1.1]
Per-protocol sample					
LSAS					
GCBT	83.12 [73.8;92.4]	49.01 [39.5;58.5]	38.69 [29.3;48.1]	1.53 [1.0;2.1]	2.00 [1.3;2.7]
GST	87.61 [80.3;94.9]	60.56 [53.1;68.0]	58.79 [50.9;66.6]	1.22 [0.8;1.6]	1.30 [0.9;1.7]
AVPDSI					
GCBT	53.64 [50.2;57.1]	44.72 [41.0;48.5]	42.95 [38.9;47.0]	0.91 [0.5;1.4]	1.10 [0.6;1.6]
GST	53.70 [51.0;56.4]	47.86 [44.9;50.8]	45.67 [42.4;49.0]	0.59 [0.3;0.9]	0.82 [0.5;1.2]

Note: Measurements: T0=baseline, T3= 3-month-follow up, T5= 12-month follow-up. EM=estimated mean, CI= 95% confidence interval, d^w=effect size within. LSAS= Liebowitz social anxiety scale, AVPDSI=Avoidant personality disorder severity index. GCBT = group cognitive behavioral therapy; GST = group schema therapy.

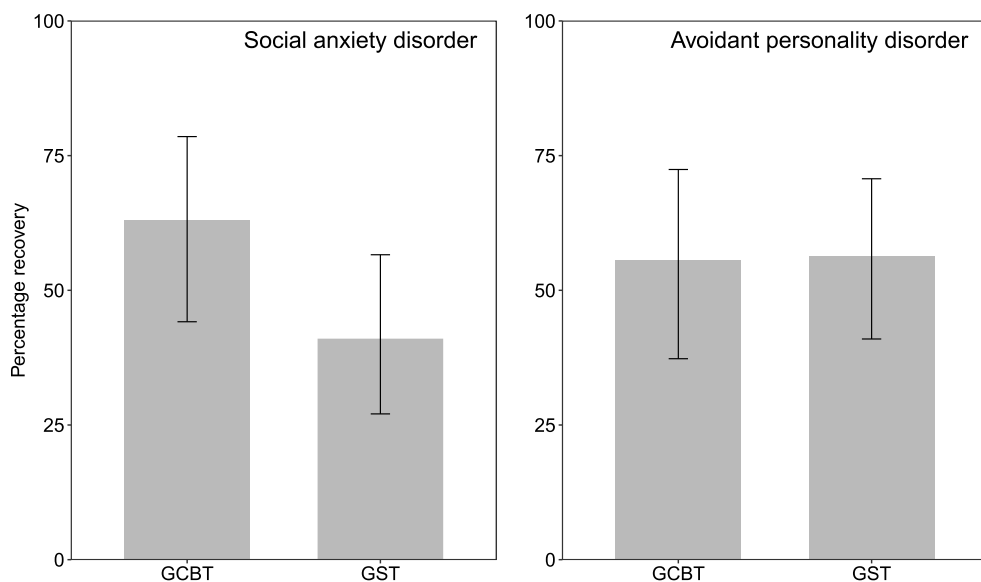
Analyses in the PP sample also showed a significant effect for time and no interaction effect for the LSAS and the AVPDSI (see Figure 3 & Table 4). Between group effect sizes for GCBT versus GST for the LSAS at T3 and T5 were respectively 0.32 (95% CI [-0.14; 0.77]) and 0.70 (95% CI [0.23; 1.17]), and for the AVPDSI 0.31 (95% CI [-0.15; 0.77]) at T3 and 0.27 (95% CI [-0.19; 0.73]) at T5. The LSAS within group effect sizes at T3 and T5 were respectively 1.53 and 2.00 for GCBT and 1.22 and 1.30 for GST. For the AVPDSI, these were respectively 0.91 and 1.09 for GCBT and 0.59 and 0.82 for GST.

Data on clinical change are presented in Table 5. Interview-based outcomes of the MINI section SAD and SCID-II section AVPD showed that in the PP sample no significant differences were found in the odds of recovery. For participants in the GST group, compared to GCBT, the odds ratio for SAD was 0.41 ($p = 0.08$, 95% CI [0.15; 1.12]) and for AVPD 1.04 ($p = 0.95$, 95% CI [0.39; 2.78]). See Figure 4 for recovery rates.

Table 5 Reliable change indices LSAS and AVPDSI per condition in per protocol sample

Outcomes	LSAS				X ²	p	AVPDSI				X ²	p
	GCBT		GST				GCBT		GST			
	n	%	n	%			n	%	n	%		
3-month FU (T3)												
Respondents	29	96.7	45	91.8			29	96.7	45	93.8		
Reliable change	23	79.3	29	64.4	1.87	0.17	18	62.1	20	44.4	2.19	0.14
Below cut off	8	27.6	8	17.8	0.51	0.48	5	17.2	8	17.8	0.00	0.95
Clinical change	8	27.6	8	17.8	1.00	0.32	4	13.8	7	15.6	0.04	0.84
12-month FU (T5)												
Respondents	28	93.3	38	84.4			27	90	38	86.4		
Reliable change	25	89.3	27	71.1	3.21	0.07	19	70.4	23	60.5	0.67	0.41
Below cut off	13	46.4	11	29.0	2.13	0.14	6	22.2	10	26.3	0.14	0.71
Clinical change	13	46.4	11	29.0	2.13	0.14	6	22.2	8	21.1	0.01	0.91

Note: Per protocol sample, GCBT: n=30, GST n=49. Respondents = people participating in the questionnaire/ interview. FU=follow-up. GCBT = Group Cognitive Behavioral Therapy, GST = Group Schema Therapy. ^a Number of AVPDSI respondents at T0 n=48. Reliable change = reliable change index (RCI) below -1.96; recovery = scoring below cut-off (LSAS score: 35 (von Glischinski et al., 2018); AVPDSI score: 37 (Baljé et al., 2023)); Clinical changed = reliable change and scoring below cut-off. All chi-square tests had one degree of freedom.

**Figure 4.** Recovery rate of protocol completers per treatment condition.

DISCUSSION

This RCT aimed to compare treatment effects of GCBT and GST delivered to patients diagnosed with both SAD and AVPD. Specifically designed to treat PDs and treatment-resistant chronic conditions, GST was assumed to be superior. No differences in primary outcomes were found. Both groups improved significantly over time. Large effect sizes were found for social anxiety symptoms at 3- and 12-month follow-up. Effect sizes for manifestations of avoidant personality were moderate but became larger at 12-month follow-up. Significant improvements and no differences between therapies were also found for depressive symptoms and quality of life. GST showed superiority in treatment completion, with attrition being significantly smaller. PP analyses did not show significant differences in treatment outcomes. The number of patients realizing a reliable change was substantial. However, most patients did not experience clinical change at three- and twelve-month follow-up on SAD symptoms and AVPD manifestations. At one-year follow-up, more than half of the patients recovered with respect to SAD and AVPD diagnoses. In summary, analyses in ITT and PP samples showed beneficial treatment effects, but except for treatment retention, no evidence of the superiority of GST over GCBT was found.

Although treatment results of GST and GCBT were substantial, the number of patients realizing a normative level of functioning was limited. While individuals can lose criteria and drop below the diagnostic threshold, impairment in functioning will likely remain (Shea et al., 2002). AVPD patients are generally considered more severely and pervasively socially anxious than SAD patients without AVPD (Renneberg et al., 1990). Due to avoidance as primary coping, it might take them longer to benefit from group treatment. Alden (1989) hypothesized that although treatment can reduce the problems of AVPD patients, there is also a possibility that AVPD patients might not be capable of full recovery. In both conditions, the greatest improvement was achieved during treatment, and after the first 15 sessions further improvements were realized in the second half of therapy. This indicates an added value of offering extended CBT treatment. After treatment, progress continued more slowly or leveled off.

An important question for further research is to what extent longer or more intensive treatment will lead to more progress. Secondly, future studies should address whether or not an individual treatment format, or more individual sessions provided in addition to group sessions, would lead to better effects than group treatment, especially since a recently published RCT found a combined individual-group ST-format to be superior to predominantly group-ST for borderline PD (Arntz et al., 2022).

Notable is the proportionally greater and high dropout of patients in GCBT compared to GST. Reasons given by patients suggest that avoidance played a significant role in attrition, irrespective of treatment. Possible elements interfering with retention and outcomes for AVPD patients, according to Centonze et al. (2021) are: dysfunctional interpersonal (unconscious) behavioral habits in relating to others

starting from a negative self-image and from maladaptive schema, difficulties in forming alliances, and in setting and committing to concrete goals. GST explicitly addressed patients' alliance with the group, feeling safe and connected, combined with the role of therapists as protective, validating, and caring parental-like figures. These factors might have reduced dropout, caused by negative core ideas as I don't fit in and I am inept. Also helpful might have been GSTs focus on dealing with punitive, demanding, and avoidant modes, strengthening the healthy adult mode, and supporting the vulnerable child mode. Possibly, GCBT was experienced as too confronting by AVPD patients. Exposure and cognitive restructuring are core elements and ask for concrete goals. These treatment elements can be challenging for patients, characterized by avoidance and difficulties in recognizing emotions and describing their thoughts. During sessions and as homework, exposure exercises might have provoked self-critical thoughts, fear of making mistakes, and being harshly judged (Centonze et al., 2021). Subsequently, avoiding therapy by dropping out might be seen as the only way of self-protection. Attrition in CBT due to a preference for ST seems unlikely since no significant difference in credibility for both modalities was found. Preventing attrition, especially in GCBT, should become a focus when treating SAD-AVPD patients.

Comparison of our results with other studies on SAD and AVPD is difficult since they differ in modality, format, duration, sample size, and (follow-up) measures. Comparison with SAD studies applying the Heimberg protocol and LSAS (Mayo-Wilson et al., 2014) showed our effect size after 15 sessions to be similar or somewhat lower. Our attrition rate and baseline scores were higher, possibly due to our larger number of sessions and more severely impaired sample. Studies on AVPD are scarce. Simonsen et al. (2019) mentions two RCTs on CBT, and the few studies in his review showed improvements in symptoms (social anxiety, depression) that are maintained at follow-up, a pattern also found in this RCT.

The question remains why the outcomes of this RCT did not confirm the originally hypothesized superiority of GST over GCBT. Following findings in a large RCT on mixed PDs, Bamelis et al. (2014) mentions the extensive processing of aversive childhood experiences as a possible explanation for the significantly higher recovery of PDs in individual ST compared to TAU and clarification-oriented psychotherapy. The absence of superiority in our trial was possibly caused by fewer sessions (30 versus 50), the inclusion of only AVPD patients, the group format, and CBT being an established effective treatment. To optimize the yield of GST, adding individual sessions could enhance the processing of adverse childhood experiences. A group format inherently provides less opportunity for individual experiential exercises such as imagery rescripting. In a group, therapists must divide their attention among all participants; therefore, hiding in avoidant coping may be easier for patients in GST than in individual ST and might negatively influence treatment effects. Moreover, in the studied GST protocol, the use of exposure in vivo exercises was prohibited, to limit overlap between the treatments. However, exposure in vivo is in case of rigid

avoidance behavior a technique that is recommended in ST in the last phase of treatment, where behavioral pattern breaking is addressed (Young et al., 2003). There are good reasons why exposure in vivo is needed to address rigid avoidance, for example second order conditioning of stimuli signaling threat and habit formation (see Arntz, 2020, for a discussion why addressing underlying schema's is sometimes not enough to reach an optimal treatment result).

According to Young et al. (2003), besides creating awareness and offering experiential and cognitive exercises, behavioral change is essential to change underlying schemas and gain maximum benefit from ST. If the cognitive and experiential phases are not adequately implemented, structural changes in schema-driven behavior will be unlikely. Both phases are essential to prepare patients for changing their behaviors. In GCBT, exposure is a core element involving behavioral pattern breaking. Treatment retention might profit from more extensive preparation of exposure and helping patients to overcome difficulties arising from schema activation. In GST, patients might benefit from more extensive application of behavioral techniques, including exposure in vivo, to help patients break avoidant behavioral patterns. However, this should not come at the expense of preparing patients for this critical phase. Nevertheless, possibly effectiveness of GST could be increased by more extensive use of exposure in vivo.

At both participating sites, group treatments were common. To reduce waiting time and prevent referred patients from dropping out, GCBT and GST were offered in a semi-open group, and protocols were modified accordingly. In GCBT, therapists viewed the changing group composition as an opportunity for exposure. To our knowledge, our study was the first to apply GST in a semi-open group. GST therapists expressed concern about the negative consequences of patients leaving and entering the group and made efforts to reinforce feelings of safety. Patients said that the entrance of new members in the group was challenging, but helping newcomers also boosted their self-confidence and made them see their progress. Furthermore, the triggering of different modes provided them with learning opportunities. No indications were found that ST is not feasible in a semi-open group. However, the format might have influenced dropout rates.

Our study has several strengths. Firstly, assessing diagnoses with structured clinical interviews provides high diagnostic validity. Secondly, both self-report and clinician-assessed measures were used. Thirdly, applying the semi-structured AVPDSI interview enabled a dimensional assessment of severity and changes in AVPD manifestations. Lastly, the findings of this RCT have high external and ecological validity. The trial took place in a regular mental health facility and applied limited exclusion criteria. After this RCT, both therapies were continued in the same format in the outpatient clinics involved. Some limitations also warrant attention. Firstly, this RCT was developed as a superiority trial. The absence of significant differences allows no claims of equivalence. Equivalence trials need a larger sample (Christensen, 2007). Secondly, our study was powered to detect differences between

both treatments of a medium effect size (Cohen's $d = 0.5$; Baljé et al., 2016). While a larger sample has more power to find significance when smaller differences are present, we chose this effect size because this is important from a patient's perspective and of relevance for clinical practice, whereas in our opinion smaller effect sizes are less suitable to guide clinical choices to opt for one of the investigated treatments. Thirdly, no control group was included. However, spontaneous recovery is unlikely in chronic conditions such as SAD and AVPD (Keller, 2003, Lampe and Malhi, 2018). Fourthly, no treatment data were gathered during naturalistic follow-up. However, most substantial improvements were achieved before. Fifthly, our sample with comorbid SAD and AVPD does not represent all AVPD patients. Nevertheless, comorbid SAD-AVPD is common and represents a supposedly more severely impaired group of AVPD patients (Cox et al., 2009). Sixthly, although exposure was a prohibited technique in ST and checked upon assessing treatment integrity, mere presence in group sessions may have unintentionally provided a form of exposure to GST participants. Lastly, the considerable attrition found in GCBT might have impacted the outcomes of this trial. However, the similarity of the ITT and PP analysis results gives us confidence that these consequences were limited.

The current study is highly relevant since it extends our knowledge of the treatment of AVPD and is the first to compare GCBT and GST in a semi-open format. However, future treatment studies remain necessary. They should focus on preparing and motivating patients to break their persistent avoidance patterns and stay in treatment, thereby offering them a more fulfilling life with meaningful social contacts and participation. In addition, research exploring possible predictors, moderators, and mediators might facilitate the adaptation of treatments to patients' needs and result in more personalized treatments. This study shows that GCBT and GST are valuable treatment options for patients with SAD and AVPD. Although not found superior, GST showed substantial and promising results. Because of its acceptability, it offers clinicians a feasible treatment option to help severely avoidant patients to overcome their difficulties.

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CHAPTER 4 - SUPPLEMENTARY MATERIAL

Supplementary Table A1 2010 checklist of information to include when reporting a randomised trial

Section/Topic	No	Checklist item	Page
Title and abstract			
	1a	Identification as a randomised trial in the title	123
	1b	Structured summary of trial design, methods, results, and conclusions	124
Introduction			
Background and objectives	2a	Scientific background and explanation of rationale	125-136
	2b	Specific objectives or hypotheses	128
Methods			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	128
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	NA
Participants	4a	Eligibility criteria for participants	128
	4b	Settings and locations where the data were collected	128
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	129-132
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures	129
	6b	Any changes to trial outcomes after the trial commenced, with reasons	129
Sample size	7a	How sample size was determined	128
	7b	When applicable, explanation of any interim analyses and stopping guidelines	NA
Randomisation:			
Sequence generation	8a	Method used to generate the random allocation sequence	128
	8b	Type of randomisation; details of any restriction (such as blocking and block size)	128
Allocation concealment	9	Mechanism used to implement the random allocation sequence, describing any steps taken to conceal the sequence until interventions were assigned	128-129
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	128

Supplementary Table A1 CONSORT 2010 checklist of information to include when reporting a randomised trial - continued

Section/Topic	No	Checklist item	Page
Blinding	11a	If done, who was blinded after assignment to interventions and how	129
	11b	If relevant, description of the similarity of interventions	131
Statistical methods	12a	Statistical methods used to compare groups for primary and secondary outcomes	132-133
	12b	Methods for additional analyses, such as subgroup analyses and adjusted analyses	133
Results			
Participant flow	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome	134
	13b	For each group, losses and exclusions after randomisation, together with reasons	134
Recruitment	14a	Dates defining the periods of recruitment and follow-up	136
	14b	Why the trial ended or was stopped	136
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group	135-136
Numbers analysed	16	For each group, number of participants included in each analysis groups	134
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)	136-140, 152-154
	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	136-137, 139
Ancillary analyses	18	Results of any other analyses performed	155
Harms	19	All important harms or unintended effects in each group	136
Discussion			
Limitations	20	Trial limitations, addressing sources of potential bias, imprecision, and multiplicity of analyses	143
Generalisability	21	Generalisability (external validity, applicability) of the trial findings	144
Interpretation	22	Interpretation consistent with results, balancing benefits and harms, and other relevant evidence	141-144
Other information			
Registration	23	Registration number and name of trial registry	129
Protocol	24	Where the full trial protocol can be accessed, if available	128-129
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	144

Supplementary Table A2: Anova LSAS and AVPDSI, intention-to-treat and per-protocol sample

	Intention to treat sample				Per protocol sample			
	numDF	denDF	F	p	numDF	denDF	F	p
LSAS^a								
Intercept	1	743	1976.15	<.01	1	743	850.87	<.01
Condition	1	743	6.86	.01	1	743	8.23	<.01
Time	5	743	38.75	<.01	5	743	27.02	<.01
Condition x time	5	743	1.66	.14	5	743	1.92	.09
AVPDSI^b								
Intercept	1	208	4313.41	<.01	1	135	2925.34	<.01
Condition	1	144	0.42	.52	1	76	0.61	.44
Time	2	208	44.76	<.01	2	135	25.41	<.01
Condition x time	2	208	2.46	.09	2	135	0.82	.44

Note: ^a analyzed using covariance pattern models ^b analyzed using mixed models. LSAS = Liebowitz social anxiety scale; AVPDSI = Avoidant personality disorder severity index.

Supplementary Table A3: Anova secondary outcomes: IDS and WHO, intention-to-treat sample

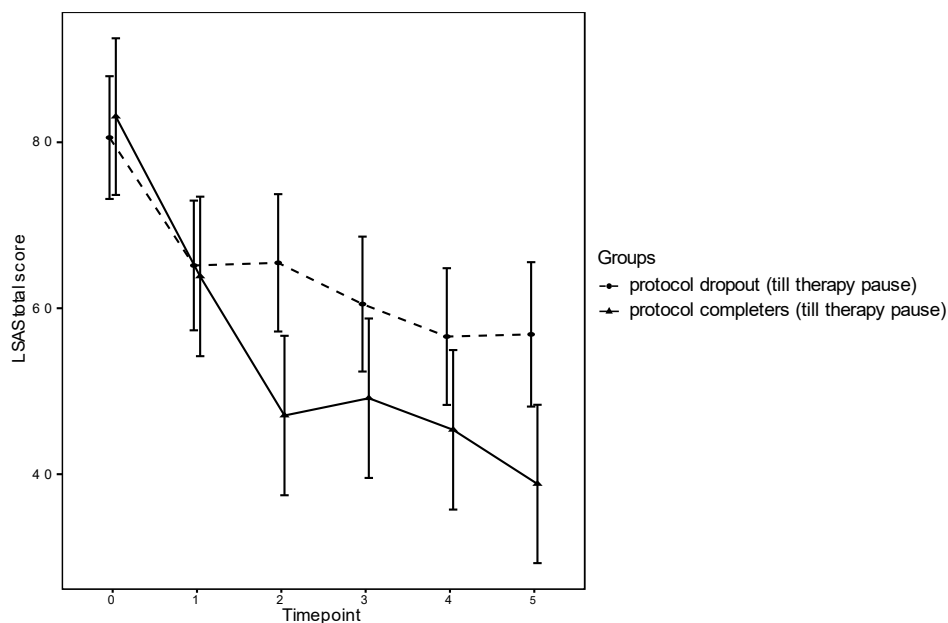
Measure	numDF	denDF ^a	F	p
IDS				
Intercept	1	742	907.19	<.01
Condition	1	742	2.36	.12
Time	5	742	11.17	<.01
Condition x time	5	742	1.68	.14
WHOQOL-BREF				
- Physical health				
Intercept	1	733	1886.29	<.01
Condition	1	733	1.35	.25
Time	5	733	8.97	<.01
Condition x time	5	733	0.72	.61
- Psychological health				
Intercept	1	732	2215.93	<.01
Condition	1	732	3.56	.06
Time	5	732	12.39	<.01
Condition x time	5	732	0.89	.48
- Social relations				
Intercept	1	733	1994.93	<.01
Condition	1	733	2.89	.09
Time	5	733	3.28	.01
Condition x time	5	733	1.51	.18
- Environment				
Intercept	1	733	4734.07	<.01
Condition	1	733	1.01	.31
Time	5	733	3.77	<.01
Condition x time	5	733	2.00	.08

Note: ^a analyzed using covariance pattern models. IDS = inventory of depressive symptoms; WHO = WHOQOL-BREF: quality of life questionnaire –short version (measures four domains).

Supplementary Table A4: Estimated means and within-group effect sizes IDS and WHO per condition, intention-to-treat sample

Measure	T0 EM [CI]	T3 EM [CI]	T5 EM [CI]	T0-T3 d ^w [CI]	T0-T5 d ^w [CI]
IDS					
GCBT	31.01 [28.0;34.0]	23.16 [19.9;26.4]	21.24 [17.9;24.6]	0.65 [0.4;0.9]	0.81 [0.6;1.1]
GST	32.77 [29.6;35.9]	26.62 [23.3;30.0]	25.16 [21.6;28.7]	0.51 [0.3;0.8]	0.63 [0.4;0.9]
WHO D1					
GCBT	46.37 [42.4;50.4]	57.02 [52.7;61.3]	57.38 [52.9;61.9]	0.66 [0.4-0.9]	0.68 [0.4-0.9]
GST	45.53 [41.4;49.6]	54.10 [49.6;58.6]	52.19 [47.4;56.9]	0.53 [0.3-0.8]	0.41 [0.2-0.7]
WHO D2					
GCBT	40.42 [37.4;43.1]	49.09 [45.0;53.2]	53.22 [48.3;58.1]	0.70 [0.5;1.0]	1.03 [0.8;1.3]
GST	37.60 [34.7;40.5]	44.23 [40.0;48.5]	46.56 [41.4;51.7]	0.52 [0.3;0.8]	0.71 [0.5;1.0]
WHO D3					
GCBT	49.05 [44.8;53.3]	54.92 [50.3;59.6]	58.61 [53.8;63.5]	0.31 [0.1;0.5]	0.51 [0.3;0.8]
GST	48.02 [43.7;52.4]	50.49 [45.7;55.3]	50.83 [45.7;55.9]	0.13 [-0.1;0.4]	0.15 [-0.1;0.4]
WHO D4					
GCBT	61.68 [58.7;65.0]	67.65 [64.2;71.1]	68.52 [64.9;72.1]	0.44 [0.2;0.7]	0.50 [0.3;0.7]
GST	61.82 [58.6;65.1]	64.17 [60.6;67.7]	65.46 [61.7;69.2]	0.18 [-0.1;0.4]	0.27 [0.0;0.5]

Note: Measurements: T0=baseline, T3= 3-month-follow up, T5= 12-month follow-up. EM=estimated mean, CI= 95% confidence interval, d^w=effect size within. IDS = inventory of depressive symptoms; WHO = WHOQOL-BREF: quality of life questionnaire short version measuring four domains: WHO: D1= physical health, D2= psychological health; D3 = social relations, D4 = environment. GCBT = group cognitive behavioral therapy; GST = group schema therapy.

**Supplementary Figure A1** Estimated mean LSAS scores over time for group cognitive behavioral therapy participants, completers versus non completers

Supplementary Table A5a Group cognitive behavioral therapy participants, estimated means LSAS, completers versus non completers

Measure	T0 EM [CI]	T1 EM [CI]	T2 EM [CI]
LSAS			
Completers	83.09 [73.65, 92.53]	63.83 [54.22;73.45]	47.07 [37.46;56.68]
Non-completers	80.57 [73.17; 87.96]	65.16 [57.34;72.97]	65.47 [57.20;73.75]

Note: Measurements: T0=baseline, T1= 15-week/halfway treatment, T2= 30-week/end of treatment. EM=estimated mean, CI= 95% confidence interval, LSAS= Liebowitz social anxiety scale.

Supplementary Table A5b Anova and fixed effects for the LSAS, group cognitive behavioral therapy participants, completers versus non completers.

ANOVA	numDF	denDF	F	p
LSAS				
Intercept	1	368	662.06	<.01
Protocol completers	1	368	4.24	0.04
Time	5	368	26.90	<.01
Protocol completers x time	5	368	4.99	<.01
Fixed effects	Value	SE	t	p
Intercept	80.57	3.74	21.54	<.01
Protocol completers	2.53	6.06	0.42	0.68
Time1	-15.41	2.54	-6.07	<.01
Time2	-15.10	3.42	-4.42	<.01
Time3	-20.07	3.64	-5.52	<.01
Time4	-23.98	4.07	-5.90	<.01
Time5	-23.72	4.61	-5.15	<.01
Protocol completers x time1	-3.85	3.90	-0.99	0.32
Protocol completers x time2	-20.93	5.17	-4.05	<.01
Protocol completers x time3	-13.87	5.80	-2.39	0.02
Protocol completers x time4	-13.77	6.41	-2.15	0.03
Protocol completers x time5	-20.55	6.98	-2.95	<.01

Note: ^a analyzed using covariance pattern models (first order autoregressive). LSAS = Liebowitz Social Anxiety scale.