Cognitive behaviour therapy for social anxiety in autism spectrum disorder: a systematic review

Article

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Abstract

Purpose: Individuals who have autism spectrum disorders (ASD) commonly experience anxiety about social interaction and social situations. Cognitive behaviour therapy (CBT) is a recommended treatment for social anxiety (SA) in the non-ASD population. Therapy typically comprises cognitive interventions, imagery-based work and for some individuals, behavioural interventions. Whether these are useful for the ASD population is unclear. Therefore, we undertook a systematic review to summarise research about CBT for SA in ASD.

Approach: Using *a priori* criteria, we searched for English-language peer-reviewed empirical studies in five databases. The search yielded 1364 results. Titles, abstracts and relevant publications were independently screened by two reviewers.

Findings: Four single case studies met the review inclusion criteria; data were synthesised narratively. Participants (three adults and one child) were diagnosed with ASD and social anxiety disorder. There were commonalities in interventions and techniques used: participants were encouraged to identify and challenge negative thoughts, enter anxiety-provoking social situations, and develop new ways of coping. Unlike CBT for SA in non-ASD individuals, treatment also included social skills interventions. Outcomes were assessed using self- or informant-reports. Improvements in social anxiety and depressive symptoms, social skills, and activity levels were noted. Generalisability of results is hampered, however, by the small number of studies and participants, and lack of randomised controlled trial (RCT) conditions employed.

Research implications: Future studies should investigate how beliefs and behaviours indicative of SA can be ameliorated in individuals with ASD.

Originality: This is the first review to synthesise empirical data about CBT for SA in ASD.

Keywords: Autism spectrum disorder (ASD), Asperger syndrome, Social anxiety, Social phobia, Cognitive behaviour therapy (CBT)

Introduction

Anxiety and worry about social situations are common experiences for individuals with autism spectrum disorders (ASD). Although the assessment of social anxiety (SA) can prove complex due to diagnostic overlapping and overshadowing, data obtained from epidemiological and clinical samples indicate that up to 50% of young people and adults with ASD have clinically significant SA symptoms (Bellini, 2004; Maddox and White, 2015; Spain *et al*., 2016a); rates that far exceed population norms (NICE; 2013). Of note, many studies investigating SA in ASD samples focus more intently on affective and behavioural symptoms rather than the social-evaluative concerns or fears of negative evaluation, which are characteristic of SA.

Causal and maintaining mechanisms for SA likely include a combination of genetic, psychological, and social factors (e.g. Bellini, 2006; NICE, 2013; Morrison and Heimberg, 2013; White *et al*., 2009). For example, individuals with ASD may have a genetic vulnerability for anxiety (e.g. Tick *et al*., 2016), as well as a predisposition for behavioural inhibition. Also, innate difficulties with interaction and communication conceivably impact on social situations and relationships. Impairments in the ability to recognise and understand others' mental states (Baron-Cohen *et al*., 2001) may give rise to problematic interactions, and thus potentially contribute to the development of negative beliefs about the self, e.g. about difference or inferiority, and also, perceived ability to react and respond appropriately during social interactions. It is feasible that peer rejection, bullying, and ostracism during childhood and adolescence (Schroeder *et al*., 2014) reinforce these negative beliefs and encourage social withdrawal and isolation; factors that can precipitate and perpetuate SA. Further, the cognitive style associated with ASD, such as perseveration, rumination, and a tendency for focusing on specific details rather than 'the bigger picture' (also known as weak central coherence; Brunsdon and Happé, 2015) may mean that it is more difficult for individuals to ignore or rationalise negative automatic thoughts which occur before, during, or after social interactions. Similarly, impairments or biases in memory, attention, emotion, or information processing, may encourage rumination or safety behaviours, such as mental rehearsal, an inward focus (seeing oneself as a social object), or post-event processing (e.g. Clark, 1999; Morrison and Heimberg, 2013; Rapee and Heimberg, 1997). Finally,

preferences for routinised activities and sensory aversions (WHO, 1992) may perpetuate or exacerbate avoidance of general or specific social situations.

In the non-ASD population, there is increasing evidence to suggest that cognitive therapy and cognitive behaviour therapy (CBT), delivered via individual, group-based or online platforms, are effective psychological interventions for reducing SA symptoms (e.g. Carlbing *et al*., 2009; Hedman *et al*., 2011; NICE, 2013). CBT is a type of talking therapy that involves exploring the ways in which early life experiences or critical events can affect the way that people think about themselves and others, how they feel, and how they cope. Treatment involves supporting individuals to develop new ways of thinking about, and reacting or responding to situations, with a view to reducing negative affect, and enhancing self-efficacy (Kennerley and Westbrook, 2011).

CBT for SA shares similarities with CBT for other anxiety disorders. Treatment typically involves weighing up and testing out the accuracy of negative thoughts and beliefs, identifying more neutral explanations for the manifestation of autonomic symptoms, and trying new ways of managing and coping. There are, however, some elements of treatment that are specific to SA. These include an emphasis on learning to shift attentional focus from internal states to external stimuli, and imagery rescripting in order to address traumatic memories about, and arising from, adverse or aversive social interactions. Overall, cognitive interventions are deemed critical for the success of treatment, more so than behavioural techniques (Clark, 1999; NICE, 2013).

Recent systematic reviews demonstrate that anxiety and affective symptoms can be ameliorated in individuals with ASD, following a course of CBT (Lang *et al*., 2010; Spain *et al*., 2015). With few exceptions, studies to date have investigated the effectiveness of CBT for transdiagnostic constructs and processes (such as anxiety or avoidance), rather than specific disorders. While there is some evidence to suggest that transdiagnostic interventions have clinical utility, a recent meta-analysis by Anderson and colleagues (2016) concluded that the effects of these approaches may be 'inflated' and overestimated. Also, treatment manuals used in CBT studies for the ASD population seem to favour behavioural interventions. While it may be that this clinical population experiences difficulty with using cognitive techniques e.g. due to alexithymia (difficulties identifying own emotions; Bird and Cook, 2013), findings from empirical research indicate that these techniques can be useful

(Lang *et al*., 2010; Spain *et al*., 2015). Given that there are unique mechanisms which are hypothesised to maintain SA – such as self-focused attention and post-event processing which are typically targeted by cognitive techniques, it is important to understand whether 1) individuals with ASD can derive benefit from CBT for SA, 2) which techniques are used during treatment, and 3) how the structure or content of therapy is modified, if at all, to accommodate either core ASD or associated difficulties. This systematic review sought to summarise the empirical literature about CBT for SA in ASD.

Methods

Search strategy: We searched for English-language peer-reviewed publications in five databases: PubMed, Medline, PsycINFO, Web of Science and CENTRAL (Cochrane Central Register of Controlled Trials). We searched for studies published from the date of inception until 31 May, 2016. Search terms included autis* - Asperger* - develop* dis* AND social anx* - social phobi*. There was no stipulation about the types of comparator interventions or methods of outcome measurement, in order to maximise the search sensitivity.

Inclusion criteria: Our *a priori* inclusion criteria were 1) empirical studies, 2) describing cognitive, behavioural or CBT interventions, 3) specifically designed to address symptoms of SA, social anxiety disorder or social phobia, 4) offered via any modality, 5) for children, adolescents or adults diagnosed with any sub-type of ASD, and 6) which assessed symptoms at least once pre- and post-intervention.

Exclusion criteria: We excluded 1) grey literature, 2) pure social skills interventions (because these are neither specifically designed to target beliefs associated with negative evaluation nor are they necessarily intended to target anxiety about social situations), and 3) CBT interventions targeting general mental health symptoms, rather than SA symptoms specifically.

Study selection: See Figure 1 for an overview of the search process. The search initially yielded 1363 results, and 163 duplicates were removed at this stage. The remaining 1200 titles and abstracts were reviewed independently by two reviewers (DS and JS). Of these, 22 full-text papers were retrieved for further scrutiny. Nineteen studies were excluded, as these were reviews or intervention studies which did not meet the *a priori* criteria. One additional study was retrieved following a handsearch. Hence, four studies met the review inclusion

criteria (Cardaccioto and Herbert, 2004; Schleismann and Gillis, 2011; Turner and Hammond, 2016; Wright, 2013) (See Table 1).

Analysis plan: As there were a limited number of studies included, all of which were single case reports, we synthesised data using a narrative approach.

Findings

Overview of studies: Two case studies were undertaken in the UK (Turner and Hammond, 2016; Wright, 2013), and two in the US (Cardaccioto and Herbert, 2004; Schleismann and Gillis, 2011).

Participants: Participants were four males: two adults with Asperger syndrome, one adult with ASD and an intellectual disability (ID), and one child with Asperger syndrome. All participants were also reported to have social anxiety disorder. Additionally, all three adults were considered to have clinically significant symptoms of depression.

Quality assessment: We did not formally assess the methodological quality of studies included, given that these were N = 1 designs.

Referral routes to CBT: Limited information was available about the study sampling frames. As such, it was unclear whether participants were representative of individuals referred to the respective clinical services. Nonetheless, it was noted that in all cases, participants had self-referred or a significant other (such as a parent) had requested psychological input.

Treatment modality: All participants were offered individual sessions, albeit that in one study, parent-training was offered as an adjunct to these sessions (Schleismann and Gillis, 2011).

Intervention aims: The intervention aims were similar across studies. The intention was to improve social skills, reduce anxiety about and avoidance of social situations, and in one case, enhance self-esteem (Turner and Hammond, 2016), and in another, augment employment skills (Cardaccioto and Herbert, 2004).

CBT case conceptualisations: Social anxiety-specific formulations were used in two studies (Cardaccioto and Herbert, 2004; Turner and Hammond, 2016). The study by Schleismann and Gillis (2011) was informed by 'The Coping Cat' model (Kendall, 1992); a commonly used, generic framework for helping young people to understand and overcome anxiety. In three studies, both longitudinal formulations as well as maintenance cycles were devised with participants, to aid with the development of a shared understanding of the links between events, thinking styles and thoughts, feelings and emotions, and behaviours (Cardaccioto and Herbert, 2004; Turner and Hammond, 2016; Wright, 2013). Finally, in one study, an ASD-specific framework (Gaus, 2011) was referred to in order to outline potential relationships between ASD characteristics, neuropsychological processes, and presenting difficulties.

Interventions and techniques: There were commonalities in terms of the interventions and techniques employed across studies. All participants were initially offered psychoeducation about anxiety, and in some cases, about social skills. In three studies, participants were offered social skills interventions early on; a deviation from standard CBT for SA protocols (NICE, 2013). Role play and role modelling were prominent components of each study. Similarly, there was an emphasis on skills rehearsal during sessions. All participants were encouraged to develop a hierarchy of anxiety-provoking or avoided situations, which was used to inform *in vivo* tasks. It is implied that these tasks involved exposure, i.e. a behavioural intervention primarily introduced to help individuals habituate to anxious situations. Also, it is suggested that these hierarchies may have been used as a basis for behavioural experiments, i.e. cognitive interventions that facilitate the 'testing out' of the strength of (negative) beliefs, e.g. about social situations or social performance. Cognitive interventions were introduced in three studies, which involved participants learning to identify negative automatic thoughts or schema, and developing ways of challenging these either through cognitive restructuring or positive self-talk techniques. In one study, attention techniques were utilised in order to encourage a shift from focusing on internal stimuli to external cues. Finally, one individual was taught relaxation techniques. Of note, there was no mention of imagery-based work; a common component of CBT for SA in non-ASD individuals.

Parent-training: In one study, parents were involved in treatment as parent-trainers rather than parents-as-patients. This was in order to support the individual to practice techniques and skills acquired outside of therapy sessions, and to enhance "appropriate extinction of

avoidance behaviours, [and] reinforcement of approach behaviours" (Schleismann and Gillis, 2011, p. 520).

Homework: All participants were asked to complete homework tasks between sessions. Tasks primarily involved exposure, increasing activity levels, behavioural experiments, and belief-work. No data were available about the proportion of homework tasks completed, or whether participants were more likely to engage in behavioural or cognitive tasks outside of sessions.

Treatment duration: The duration of treatment was 11-15 sessions. Where reported, sessions lasted for 60 minutes. It is not known whether participants were offered breaks.

Modifications: It appears that several modifications were made to the standard structure and content of CBT for SA, seemingly to accommodate the needs that individuals with ASD (and potentially ID) have (Anderson and Morris, 2006; Attwood, 2004). Modifications included extra sessions of psycho-education, detailed information about abstract concepts (e.g. anxiety), use of visual aids (e.g. cue cards and prompts to demarcate activities during sessions), inclusion of social skills sessions, modelling of 'appropriate' social skills by therapists, numerous opportunities for skills rehearsal, and introduction of positive self-talk and coping statements. What is less clear is which modifications may have been introduced to accommodate difficulties associated with a concurrent ID (rather than ASD characteristics).

Outcome measurement: Outcome measures included self- and informant-ratings of SA, mental health, general functioning, and behavioural assessment, completed at least pre- and post-treatment. SA was measured using a clinician-administered interview (the Structured Clinical Interview for Disorders – IV), or standardised questionnaires, including the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987), Social Phobia and Anxiety Inventory (SPAI; Turner, Beidel, Dancu and Stanley, 1989), Social Phobia Weekly Summary Scale (SPWSS; Clark *et al*., 2003), Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds and Richmond, 2008), and the Fear Survey Schedule (FSS; Ollendick, 1983). In three studies, mental health was measured using the Beck Depression Inventory II (BDI; Beck, 1996), Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965), or the Brief Symptom Inventory (BSI; Derogatis, 1975). Of note, none of the self-report questionnaires have been validated for either the ASD or the ID population. General functioning was assessed using the Clinical Global Impression Scale (CGI; NIH, 1985), Vineland Adaptive Behaviour Scales II

(VABS; Sparrow, Cicchetti and Ballar, 2005), and the Clinical Outcomes in Routine Evaluation Measure (CORE-OM; Evans *et al*., 2000). Finally, role play tasks were used to assess behaviour in one study, whereas a second study used the Behaviour Assessment System for Children II-Parent Rating Scales (BASC; Reynolds and Kamphaus, 2004).

Treatment effectiveness: Results reported for each study indicated that participants seemed to derive benefit from treatment. Self-reported SA symptoms improved: participants endorsed fewer anxiety symptoms, less concern about social interactions or performance, and overall, they engaged in a wider range of social situations more frequently. Additionally, it was noted that depressive symptoms improved: participants, on average, endorsed fewer symptoms indicative of depression post-intervention. In terms of general mental health and well-being, scores on the CGI and CORE-OM shifted from the severe to the mid-range or milder end of the spectrum. As measured in one study, self-esteem was enhanced following CBT. Finally, observed social skills changed during the course of treatment, whereby participants were reported to use better verbal and non-verbal communication skills.

Discussion

A significant proportion of young people and adults with ASD feel socially anxious, and we sought to summarise published empirical data about CBT for SA in this population. Using *a priori* criteria and a fairly rigorous search process, four single case studies met the review criteria. Treatment in each involved behavioural and in most cases, cognitive interventions. These were principally designed to reduce negative affect, encourage identification of new ways of managing in and coping with social situations, and address unhelpful thoughts and beliefs. Additionally, social skills interventions were offered to three participants. Overall, improvements in SA, mental health (including low mood and paranoia), and general functioning were reported across studies, primarily on self- or informant-rating scales. Also, there was some indication that participants had a wider repertoire of adaptive strategies post-intervention. Findings synthesised here, albeit relating to a very small and select sample, are consistent with those reported in other studies; that is, individuals with ASD can derive benefit from both behavioural and cognitive interventions for anxiety symptoms (Kreslins *et al*., 2015; Lang *et al*., 2010; Spain *et al*., 2015).

It is evident that participants were offered components of standard CBT for SA protocols (NICE, 2013). For example, a fundamental aspect of CBT involves the identification and

rationalisation of negative automatic thoughts and beliefs (Kennerley and Westbrook, 2011). Despite potential concerns that individuals with ASD may struggle to use cognitive techniques, the findings described here suggest that this clinical population may find these interventions accessible, albeit that additional preparatory work may be necessary, such as to address emotional literacy. Additionally, some participants collaboratively developed a hierarchy of difficult situations, and engaged in exposure or experimentation. The ease with which participants were able to generate a hierarchy of situations is not comprehensively outlined. However, given hypothesised impairments in executive functioning (e.g. Hill, 2004), participants may have required more support with this than might be expected. While attention training and imagery-based work are deemed to be useful ways of addressing SA (NICE, 2013), none of the participants in these studies appear to have been offered imagery techniques, and attention training featured minimally. Why these interventions were not offered is not fully described. It may be, for example, that these interventions are more complex to understand, or they may not be required when working with this population.

Generalisability of study findings: The degree to which study results are generalisable to the wider ASD population remains to be seen, particularly given that there were limited data available about referral routes for CBT, all participants were male, and more importantly, each study used an N = 1 design. Nevertheless, publication of case reports is an important means of outlining innovations in clinical practice or the application of standard interventions to novel populations.

Limitations: We acknowledge that this review has several limitations. First, we solely included English-language publications. Given that there may be cultural factors associated with SA, omission of non-English language studies may mean that the review findings are only applicable to people living in Western cultures. Second, we deliberately excluded CBT interventions designed to target transdiagnostic beliefs and behaviours associated with a range of anxiety disorders. While we did so on the basis that there are unique maintaining mechanisms for SA, an alternative approach could have been to adopt a wider search remit so as to compare the relative effectiveness of interventions for general versus specific anxiety symptoms/disorders. Finally, we did not contact trialists working in the field, who may be aware of studies in press.

Clinical implications: It is encouraging that participants in studies described here derived benefit from interventions, as assessed by self- or informant-rated measures. Based on these case reports and the wider ASD literature, we propose that there are several implications for clinical practice.

First, it is quite likely that individuals who have both ASD and SA will find it difficult to spontaneously seek help and disclose their symptoms, given that they are likely to be concerned about negative evaluation (Kreiser and White, 2014). Also, SA symptoms may be long-standing and therefore not easily differentiated from the core disorder (e.g. due to diagnostic overshadowing) (Tyson and Cruess, 2012). The implication is that clinicians may need to be proactive in assessing symptoms. While studies reviewed included a relatively short assessment phase, we suggest that assessment and information-gathering may need to be the focus of several sessions, for example, to help individuals to habituate to the therapist and therapy process (e.g. Spain *et al*., 2016b).

Second, study formulations included longitudinal and cross-sectional models; not all of which were (SA) disorder-specific. In clinical practice, it may be appropriate to start 'socialising' individuals using simple maintenance cycles (Anderson and Morris, 2006; Gaus, 2011), such as those that include thoughts, feelings and behavioural responses. This is potentially less overwhelming, may offset information processing deficits, and the process may offer an insight into the emotional literacy of individuals. The use of disorder-specific formulations may be appropriate for some individuals.

Third, participants in each case study were encouraged to develop a hierarchy of difficult situations, which informed ensuing interventions. Of note, some individuals with ASD may find it hard to identify goals they would like to work towards, because this relies on a degree of abstract thought, or because the idea of change is uncomfortable (WHO, 1992). To overcome this potential obstacle, it may be useful for clinicians to suggest possible goals, or to spend several sessions exploring these.

Fourth, the number of sessions attended ranged from 11 to 15, approximately similar to CBT for SA in the non-ASD population (NICE, 2013). While it is encouraging that participants were able to effect change in the short term, and during a reasonably short period, it has been suggested elsewhere that this clinical population conceivably benefits from a protracted

period of treatment (Walters *et al*., 2016). We suggest therefore, that clinicians consider what might be an optimal number of sessions, potentially in consultation with clinical supervisors or line managers. Moreover, the duration of therapy is likely contingent on the goals for treatment, as well as possible service constraints. Equally, where reported, sessions lasted around 60 minutes, and it is unclear whether the session duration was decided based on individual preference or other factors. Whether participants were offered a break is not wholly clear. In clinical practice, it may be worth clarifying with patients whether they wish to have a break during a session, and for there to be a discussion about whether shorter or longer sessions are preferred (Attwood, 2004; Gaus, 2011). This is particularly important when addressing SA symptoms such as via behavioural experimentation outside of the therapist's room.

Fifth, there were commonalities and differences in interventions utilised across studies. A cardinal component was social skills interventions, which is not included in standard CBT protocols for SA. This raises a question about whether SA in ASD is underpinned by impairments in social skills, unlike SA in other populations (Morrison and Heimberg, 2013; Rapee and Heimberg, 1997). Clinicians may need to be pragmatic about whether to include social skills work. For example, such interventions may be necessary in order to then introduce *in vivo* exposure. Conversely, individuals with ASD and SA may have relatively good social skills, but underestimate their capacity and capabilities, thereby implying that cognitive interventions may be useful. Additionally, imagery-based work was not incorporated in studies, yet there is some empirical literature to suggest that negative imagery may be a maintaining mechanism for anxiety disorders, and SA in particular (Wild and Clark, 2011). Few studies have investigated imagery in ASD samples (Ozsivadjian *et al*., 2016), but in keeping with the hypothesis that individuals with ASD are 'visual thinkers' (Kunda and Goel, 2011), imagery may either be a causal or maintaining factor for negative affect. A cautious approach may be needed when undertaking imagery work with this group, and so clinical supervision may be a forum within which to discuss whether these techniques are necessary for ameliorating SA in this group. In one study, parent-training was offered as an adjunct to therapy (Schleismann and Gillis, 2011). While this study pertained to a child, adults with ASD may also benefit from support outside of sessions, in order to aid with the generalisation of skills and techniques acquired, and so as to 'test out' techniques in 'real-world' situations.

Finally, studies primarily relied on self-ratings of psychopathology symptoms and general functioning. It is usual to ask individuals to provide a subjective account of change, but the validity and reliability of self-report outcome measures for the ASD population is yet to be definitively established (Lecavalier *et al*., 2013). We would advocate that clinicians consider the possibility of supporting individuals with ASD to develop their own personal scales, such as those which potentially incorporate 'special interests', as a means of measuring change. However, we also consider that there is a place for standardised or clinician-administered scales, which assess distinct domains of anxiety.

Research implications: There are several implications for research. First, we suggest that there is a clinical impetus for further CBT studies to be undertaken, employing more robust trial designs, which specifically target beliefs and behaviours indicative of SA. Second, more research is needed to ascertain causal and maintaining mechanisms for SA in ASD. This may help to ensure that treatment protocols, particularly those derived from CBT, adequately address factors that may be unique to the ASD population (e.g. impairments in social skills), from mechanisms which may well contribute to SA development across populations (e.g. bullying or peer rejection). Third, it would be useful to understand better the mediating and moderating components of CBT for individuals who have both ASD and SA; for example, are social skills interventions necessary, but (in)sufficient, or is imagery-based work associated with more favourable outcomes? Finally, given that there are overlaps in the ASD and SA symptom profiles, it is important to establish how best to measure these co-morbid symptoms, as well as the relative success of treatment.

Conclusion

Individuals with ASD are vulnerable to developing SA. While causal and maintaining mechanisms for SA in ASD have been little explored, it is likely that these include genetic, psychological and social factors. As for the non-ASD population, there is an impetus for clinicians and researchers to develop effective interventions. To date, the four case studies published (in English), indicate that cognitive and behavioural interventions are clinically useful for individuals with ASD and SA. Future studies should seek to develop the intervention evidence base further.

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Figure 1 – PRISMA diagram

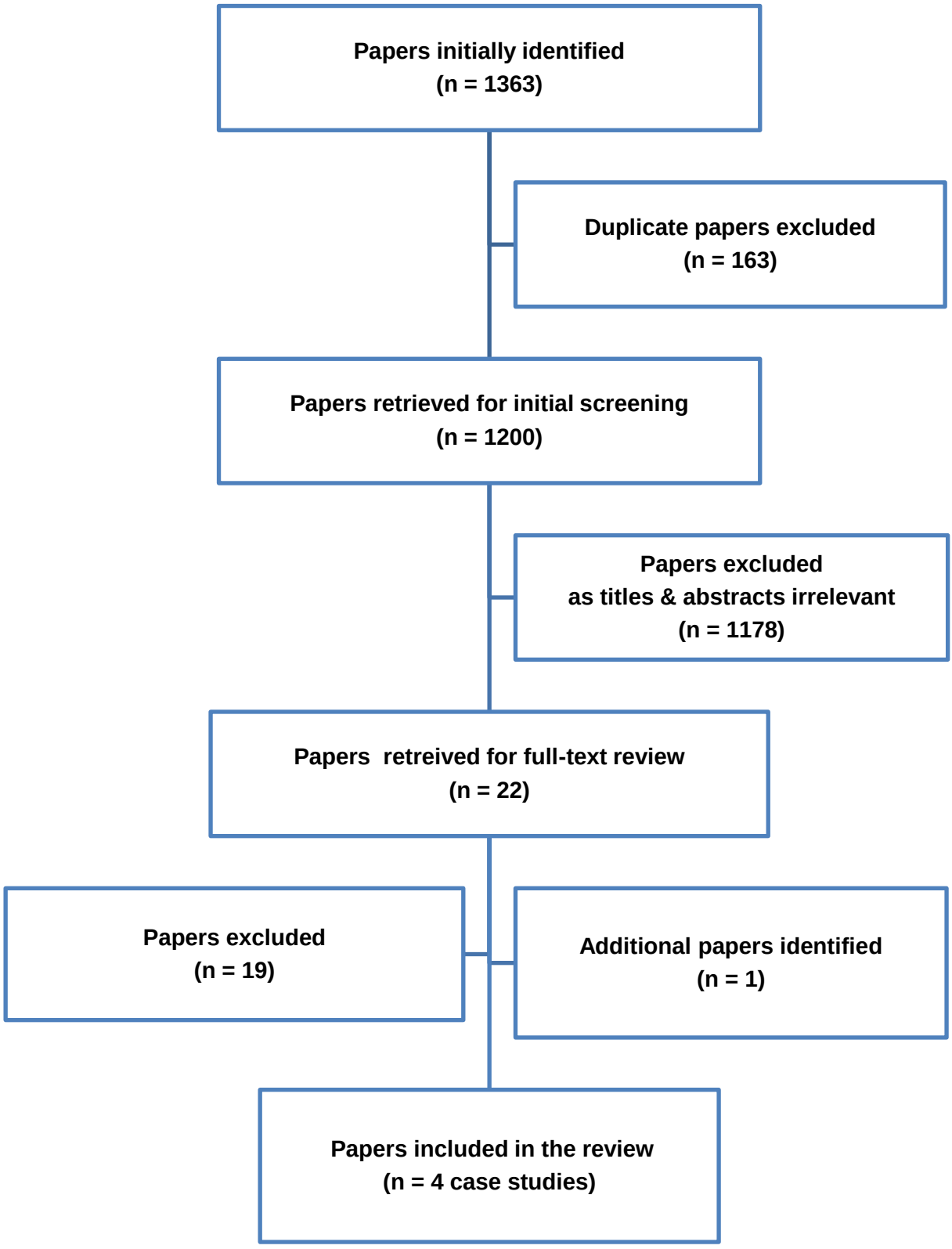

Table 1: Overview of included studies

Study	Participants	Interventions	Modifications	Outcome Measures	Results
Cardaciotto & Herbert 2004 US	Male, aged 23 *Diagnosis* - Asperger syndrome - Social anxiety disorder - Low mood	*Modality* Individual sessions *Duration* 14 sessions *Intervention remit* - Improve social skills - Reduce anxiety and avoidance of social situations - Enhance assertiveness - Augment employment skills *Formulation* Longitudinal model *Techniques* - Psychoeducation - Skills rehearsal - Role play - *In vivo* exposure - Cognitive restructuring - Homework	- Psychoeducation about abstract and complex constructs - Inclusion of social skills training - Simplified and discrete tasks - Numerous opportunities for rehearsal	*Social anxiety* - SCID IV - LSAS - STAI *Mental health* - BDI II *General functioning* - CGI *Behavioural assessment* - Role play tasks	- General reductions in anxiety and avoidance behaviours - Increased coping strategies - Post-treatment, the patient no longer met criteria for SAD - Global functioning ratings changed from severely ill to much improved - Low mood symptoms lifted
Schleismann & Gillis 2011 US	Male, aged 6 *Diagnosis* - Asperger syndrome - Social anxiety disorder	*Modality* - Individual sessions - Augmented by carer involvement *Duration* 12 sessions *Intervention remit*	- Simplification of abstract concepts - Visual schedule to outline session activities - Inclusion of social stories - Cue cards and visual aids - A parent-training	*Social anxiety* - RCMAS - FSSC *General functioning* - VABS II *Behavioural assessment* - BASC 2PRS	- General reductions in anxiety and avoidance behaviours - Increased coping strategies - Increase in approach behaviours and social

		- Reduce anxiety and avoidance of social situations *Formulation* Maintenance model *Techniques* - Psychoeducation - Development of coping skills - Skills rehearsal - *In vivo* exposure - Parent training - Homework *Carer-component* - Psychoeducation - Behavioural skill training - Modelling and rehearsal - Feedback	component - Numerous opportunities for rehearsal and modelling		initiation
Turner and Hammond 2016 UK	Male, aged 47 *Diagnosis* - Asperger syndrome - Social anxiety disorder - Low mood	*Modality* Individual sessions *Duration* 15 sessions *Intervention remit* - Improve social skills - Reduce anxiety and avoidance of social situations *Formulation* Longitudinal and maintenance models	- Inclusion of social skills training - Modelling of appropriate social skills - Psychoeducation about abstract or complex constructs - Simplified and discrete tasks - Cue cards and visual aids (mind maps) - Coping statements - Numerous opportunities for rehearsal	*Social anxiety* - LSAS - SPWSS *Mental health* - BDI II - RSE *General functioning* - CORE OM	- General reductions in anxiety and avoidance behaviours - Increased coping strategies - Post-treatment, social anxiety symptoms had reduced to below the clinical cut-off - Global functioning ratings changed to indicate significant improvement

		Techniques - Psychoeducation - Skills rehearsal - Diarising activities - *In vivo* exposure - Cognitive restructuring - Attention training - Behavioural experiments - Homework			- Low mood symptoms lifted - Self-esteem enhanced
Wright 2013 UK	Male, aged 19 *Diagnosis* - Autism - Intellectual disability - Social anxiety disorder	*Modality* Individual sessions *Duration* 11 sessions *Intervention remit* - Reduce anxiety and avoidance of social situations - Increase activity levels *Formulation* Longitudinal model *Techniques* -Psychoeducation - Relaxation techniques - Positive self-talk - *In vivo* exposure - Cognitive restructuring	- Psychoeducation about abstract or complex constructs - Simplified and discrete tasks - Use of cue cards - Increased focus on formulation development	*Mental health* - BSI - An idiosyncratic measure to rate physical symptoms of anxiety	- General reductions in anxiety and avoidance behaviours - Increased activity levels - Improvements in general mental health

SCID IV - Structured Clinical Interview for Disorders; LSAS - Liebowitz Social Anxiety Scale; STAI - Social Phobia and Anxiety Inventory; BDI II - Beck Depression Inventory II; CGI - Clinical Global Impression; RCMAS - Revised Children's Manifest Anxiety Scale; FSSC - Fear Survey Schedule for Children; VABS II - Vineland Adaptive Behaviour Scales II; BASC – 2PRS - Behaviour Assessment System for Children-2 Parent Rating Scales; SPWSS - Social Phobia Weekly Summary Scale; RSE - Rosenberg Self-esteem Scale; CORE - OM - Clinical Outcomes in Routine Evaluation; BSI - Brief Symptom Inventory