**Supplementary material**

**Search terms**

*EMBASE search terms*

(Autism/ OR (Autis\* OR Asperger\* OR Developmental Disorder\* OR Kanner\* OR Childhood Disintegrative Disorder\*).ti,ab,kw) AND (Fear/ OR Anxiety Disorder/ OR Adjustment Disorder/ OR Alexithymia/ OR Suicidal Behavior/ OR Emotional Disorder/ OR Depression/ OR Affective Neurosis/ OR Anxiety Neurosis/ OR Hypochondriasis/ OR Masked Depression/ OR Sadness/ OR Mental Stress/ OR Emotional Deprivation/ OR Anhedonia/ OR (Agoraphobi\* OR Anxiet\* OR Fear\* OR Panic\* OR Social phobi\* OR Phobi\* OR Acrophobi\* OR Anxious\* OR Claustrophobi\* OR Metaworr\* OR Overanxious\* OR Hypochondri\* OR Adjustment disorder\* OR Reactive disorder\* OR Reactive depress\* OR Transient Situational Disturbance\* OR Depress\* OR Major depress\* OR Involutional Depress\* OR Involutional Paraphreni\* OR Involutional Melancholi\* OR Treatment-resistant depress\* OR Treatment resistant depress\* OR Therapy-resistant depress\* OR Therapy resistant depress\* OR Refractory depress\* OR Dysthymi\* OR Mood\* OR Sad OR Sadness OR Seasonal affect\* OR Affective disorder\* OR Affective symptom\* OR Alexithymi\* OR Dysphor\* OR Emotional disturbance\* OR Social Anhedoni\* OR Anhedoni\* OR Physical Anhedoni\* OR Suicid\*).ti,ab,kw) AND (Psychotherapy/ OR Web-Based Intervention/ OR Telepsychiatry/ OR Teletherapy/ OR Mental Health Service/ OR Meditation/ OR Early Intervention/ OR Psychoeducation/ OR Social Competence/ OR (Psychotherap\* OR Secondary prevention\* OR Treat\* OR Therap\* OR Training\* OR Support\* OR Intervention\* OR Coach\* OR CBT OR Cognit\* OR Activ\* OR Exposur\* OR Accept\* OR Behav\* OR Meditat\* OR Mindful\* OR MBCT OR MBT OR Mental\* OR Eye movement desensitization reprocessing\* OR EMDR OR Schema\* OR SFT OR Interperson\* OR IPT OR Psychodynami\* OR Parent\* OR Famil\* OR Problem solv\* OR Group psychotherap\* OR Psychosocial\* OR Emotion-focused therap\* OR Narrative therap\* OR Person\* OR Client\* OR Nondirective therap\* OR Guid\* OR Imagery psychotherap\* OR Psychoanaly\* OR Balint\* OR Brief psychotherap\* OR Rational\* OR Reality therap\* OR Child guidance\* OR Aware\* OR Meta\*).ti,ab,kw)

*PsycINFO search terms*

(exp Autism Spectrum Disorders/ OR (Autis\* OR Asperger\* OR Developmental Disorder\* OR Kanner\* OR Childhood Disintegrative Disorder\*).ti,ab.) AND (exp Anxiety/ OR exp Anxiety Disorders/ OR exp Fear/ OR exp Compulsions/ OR exp Obsessions/ OR exp Hypochondriasis/ OR exp Major Depression/ OR exp Seasonal Affective Disorder/ OR exp Sadness/ OR exp Depression/ OR exp Psychological Stress/ OR exp Distress/ OR exp Loneliness/ OR exp Emotional Disturbances/ OR exp Adjustment Disorders/ OR exp Anhedonia/ OR exp Self-Destructive Behavior/ OR (Agoraphobi\* OR Anxiet\* OR Fear\* OR Panic\* OR Social phobi\* OR Phobi\* OR Acrophobi\* OR Anxious\* OR Claustrophobi\* OR Metaworr\* OR Overanxious\* OR Hypochondri\* OR Adjustment disorder\* OR Reactive disorder\* OR Reactive depress\* OR Transient Situational Disturbance\* OR Depress\* OR Major depress\* OR Involutional Depress\* OR Involutional Paraphreni\* OR Involutional Melancholi\* OR Treatment-resistant depress\* OR Treatment resistant depress\* OR Therapy-resistant depress\* OR Therapy resistant depress\* OR Refractory depress\* OR Dysthymi\* OR Mood\* OR Sad OR Sadness OR Seasonal affect\* OR Affective disorder\* OR Affective symptom\* OR Alexithymi\* OR Dysphor\* OR Emotional disturbance\* OR Social Anhedoni\* OR Anhedoni\* OR Physical Anhedoni\* OR Suicid\*).ti,ab.) AND (exp Psychotherapy/ OR exp Cognitive Techniques/ OR exp Anxiety Management/ OR exp Behavior Therapy/ OR exp Cognitive Behavior Therapy/ OR exp Online Therapy/ OR exp Telepsychiatry/ OR exp Telepsychology/ OR exp Teletherapy/ OR exp Relaxation Therapy/ OR exp Self-Instructional Training/ OR exp Mental Health Services/ OR exp Meditation/ OR exp Child Guidance/ OR exp Digital Interventions/ OR exp Mind Body Therapy/ OR exp Intervention/ OR exp Mindfulness-Based Interventions/ OR exp Mindfulness/ OR exp Psychoeducation/ OR exp Symptoms Based Treatment/ OR exp Coaching Psychology/ OR exp Assertiveness Training/ OR exp Communication Skills Training/ OR exp Human Relations Training/ OR exp Social Skills Training/ OR exp Community Mental Health Training/ OR exp Parent Training/ OR (Psychotherap\* OR Secondary prevention\* OR Treat\* OR Therap\* OR Training\* OR Support\* OR Intervention\* OR Coach\* OR CBT OR Cognit\* OR Activ\* OR Exposur\* OR Accept\* OR Behav\* OR Meditat\* OR Mindful\* OR MBCT OR MBT OR Mental\* OR Eye movement desensitization reprocessing\* OR EMDR OR Schema\* OR SFT OR Interperson\* OR IPT OR Psychodynami\* OR Parent\* OR Famil\* OR Problem solv\* OR Group psychotherap\* OR Psychosocial\* OR Emotion-focused therap\* OR Narrative therap\* OR Person\* OR Client\* OR Nondirective therap\* OR Guid\* OR Imagery psychotherap\* OR Psychoanaly\* OR Balint\* OR Brief psychotherap\* OR Rational\* OR Reality therap\* OR Child guidance\* OR Aware\* OR Meta\*).ti,ab.)

*Pubmed search terms*

(("Child Development Disorders, Pervasive"[Mesh]) OR (Autis\*[Title/Abstract]) OR (Asperger\*[Title/Abstract]) OR (“Developmental Disorder\*”[Title/Abstract]) OR (Kanner\*[Title/Abstract]) OR (“Childhood Disintegrative Disorder\*”[Title/Abstract])) AND (("Anxiety"[Mesh]) OR ("Fear"[Mesh]) OR ("Anxiety Disorders"[Mesh]) OR (“Obsessive Behavior”[Mesh]) OR (“Compulsive Behavior”[Mesh]) OR (“Hypochondria\*”[Mesh]) OR ("Sadness"[Mesh]) OR (“Depression”[Mesh]) OR ("Depressive Disorder"[Mesh]) OR ("Adjustment Disorders"[Mesh]) OR (“Loneliness”[Mesh]) OR (“Affective Symptoms”[Mesh]) OR (“Self-Injurious Behavior”[Mesh]) OR ("Stress, Psychological"[Mesh]) OR ("Psychological Distress"[Mesh]) OR (“Anhedonia”[Mesh]) OR (Agoraphobi\*[Title/Abstract]) OR (Anxiet\*[Title/Abstract]) OR (Fear\*[Title/Abstract]) OR (Panic\*[Title/Abstract]) OR (“Social phobi\*”[Title/Abstract]) OR (Phobi\*[Title/Abstract]) OR (Acrophobi\*[Title/Abstract]) OR (Anxious\*[Title/Abstract]) OR (Claustrophobi\*[Title/Abstract]) OR (Metaworr\*[Title/Abstract]) OR (Overanxious\*[Title/Abstract]) OR (Hypochondri\*[Title/Abstract]) OR (“Adjustment disorder\*”[Title/Abstract]) OR (“Reactive disorder\*”[Title/Abstract]) OR (“Reactive depress\*”[Title/Abstract]) OR (“Transient Situational Disturbance\*”[Title/Abstract]) OR (Depress\*[Title/Abstract]) OR (“Major depress\*”[Title/Abstract]) OR (“Involutional Depress\*”[Title/Abstract]) OR (“Involutional Melancholi\*”[Title/Abstract]) OR (“Treatment-resistant depress\*”[Title/Abstract]) OR (“Treatment resistant depress\*”[Title/Abstract]) OR (“Therapy-resistant depress\*”[Title/Abstract]) OR (“Therapy resistant depress\*”[Title/Abstract]) OR (“Refractory depress\*”[Title/Abstract]) OR (Dysthymi\*[Title/Abstract]) OR (Mood\*[Title/Abstract]) OR (Sad[Title/Abstract]) OR (Sadness[Title/Abstract]) OR (“Seasonal affect\*”[Title/Abstract]) OR (“Affective disorder\*”[Title/Abstract]) OR (“Affective symptom\*”[Title/Abstract]) OR (Alexithymi\*[ Title/Abstract]) OR (Dysphor\*[Title/Abstract]) OR (“Emotional disturbance\*”[Title/Abstract]) OR (“Social Anhedoni\*”[Title/Abstract]) OR (Anhedoni\*[Title/Abstract]) OR (“Physical Anhedoni\*”[Title/Abstract]) OR (Suicid\*[Title/Abstract])) AND (("Psychotherapy"[Mesh]) OR (“Mentoring”[Mesh]) OR (“Education”[Mesh]) OR ("Early Intervention, Educational"[Mesh]) OR (“Psychosocial Intervention”[Mesh]) OR (“Internet-Based Intervention”[Mesh]) OR (“Mental Health Services”[Mesh]) OR (“Mind-Body Therapies”[Mesh]) OR (“Mental Processes”[Mesh]) OR ("Child Guidance"[Mesh]) OR (Psychotherap\*[Title/Abstract]) OR (“Secondary prevention\*”[Title/Abstract]) OR (Treat\*[Title/Abstract]) OR (Therap\*[Title/Abstract]) OR (Training\*[Title/Abstract]) OR (Support\*[Title/Abstract]) OR (Intervention\*[Title/Abstract]) OR (Coach\*[Title/Abstract]) OR (CBT[Title/Abstract]) OR (Cognit\*[Title/Abstract]) OR (Activ\*[Title/Abstract]) OR (Exposur\*[Title/Abstract]) OR (Accept\*[Title/Abstract]) OR (Behav\*[Title/Abstract]) OR (Meditat\*[Title/Abstract]) OR (Mindful\*[Title/Abstract]) OR (MBCT[Title/Abstract]) OR (MBT[Title/Abstract]) OR (Mental\*[Title/Abstract]) OR (“Eye movement desensitization reprocessing\*”[Title/Abstract]) OR (EMDR[Title/Abstract]) OR (Schema\*[Title/Abstract]) OR (SFT[Title/Abstract]) OR (Interperson\*[Title/Abstract]) OR (IPT[Title/Abstract]) OR (Psychodynami\*[Title/Abstract]) OR (Parent\*[Title/Abstract]) OR (Famil\*[Title/Abstract]) OR (“Problem solv\*”[Title/Abstract]) OR (“Group psychotherap\*”[Title/Abstract]) OR (Psychosocial\*[Title/Abstract]) OR (“Emotion-focused therap\*”[Title/Abstract]) OR (“Narrative therap\*”[Title/Abstract]) OR (Person\*[Title/Abstract]) OR (Client\*[Title/Abstract]) OR (“Nondirective therap\*”[Title/Abstract]) OR (Guid\*[Title/Abstract]) OR (“Imagery psychotherap\*”[Title/Abstract]) OR (Psychoanaly\*[Title/Abstract]) OR (Balint\*[Title/Abstract]) OR (“Brief psychotherap\*”[ Title/Abstract]) OR (Rational\*[ Title/Abstract]) OR (“Reality therap\*”[Title/Abstract]) OR (“Child guidance\*”[Title/Abstract]) OR (Aware\*[Title/Abstract]) OR (Meta\*[Title/Abstract]))

**Supplementary table 1. Randomized controlled trials that were not included in the meta-analyses**

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| --- | --- | --- | --- | --- |
| Title | Type of psychotherapy | Outcome | Children/adults | Sample size |
| Animal-assisted social skills training for children with autism spectrum disorders (Becker, Rogers, & Burrows, 2017) | Animal-assisted social skills training | Children’s Depression Inventory | Children | Treatment: n = 17  Control group: n = 14 |
| Effects of dog assisted therapy for adults with autism spectrum disorder: An exploratory randomized controlled trial (Wijker, Leontjevas, Spek, & Enders-Slegers, 2020) | Dog assisted therapy | The Symptom checklist-90-revised (including symptoms of anxiety, agoraphobia and depression) | Adults | Treatment: n = 27  Control group: n = 26 |
| A Pilot Randomised Controlled Trial of a School-Based Resilience Intervention to Prevent Depressive Symptoms for Young Adolescents with Autism Spectrum Disorder: A Mixed Methods Analysis (Mackay, Shochet, & Orr, 2017) | School-Based Resilience Intervention | Children’s Depression Inventory | Children | Treatment: n = 16  Control group: n = 12 |
| Music therapy for children and adolescents with behavioural and emotional problems: a randomised controlled trial (Porter et al., 2017) | Music therapy | Depression Scale for Children | Children | Treatment: n = 123  Control group: n = 128 |
| Mindfulness-based therapy in adults with an autism spectrum disorder: A randomized controlled trial (Spek, van Ham, & Nyklicek, 2013) | Mindfulness-based therapy | The Symptom Checklist-90-revised  Dutch Global Mood Scale | Adults | Treatment: n = 21  Control group: n = 21 |
| Evaluating the effects of a yoga-based program integrated with third-wave cognitive behavioral therapy components on self-regulation in children on the autism spectrum: A pilot randomized controlled trial (Tanksale, Sofronoff, Sheffield, & Gilmour, 2021) | Yoga-based program integrated with third-wave cognitive behavioral therapy components | Anxiety Scale for Children–Autism Spectrum Disorder—parent version | Children | Treatment: n = 34  Control group: n = 33 |
| Impact of interoceptive training on anxiety in autistic adults: The 'aligning dimensions of interoceptive experience' (adie) trial (Quadt, Mulcahy, Critchley, & Garfinkel, 2020) | Interoceptive training | Spielberger State and Trait Anxiety Inventory Generalized Anxiety Symptoms | Adults | Treatment: n = 61  Control group: n = 60 |
| Effects of the video game 'Mindlight' on anxiety of children with an autism spectrum disorder: A randomized controlled trial (Wijnhoven et al., 2020) | Videogame: Mindlight | The Spence Children’s Anxiety Scale-parent version and child version | Children | Treatment: n = 53  Control group: n = 56 |
| Randomized Controlled Trial of a Serious Gaming Intervention for Children on the Autism Spectrum: Effects on Emotion Regulation and Social Skill (Beaumont, 2018) | Serious Gaming Intervention | The Spence Children’s Anxiety Scale—Parent | Children | Treatment: n = 35  Control group: n = 35 |
| A pilot RCT of virtual reality job interview training in transition-age youth on the autism spectrum (Genova et al., 2021) | Virtual reality job interview training | Personal Report of Public Speaking Apprehension (adapted anxiety scale) | Transition-age | Treatment: n = 7  Control group: n = 7 |
| A Randomised Controlled Feasibility Trial of Immersive Virtual Reality Treatment with Cognitive Behaviour Therapy for Specific Phobias in Young People with Autism Spectrum Disorder (Maskey et al., 2019) | Immersive Virtual Reality Treatment with Cognitive Behaviour Therapy | The Spence Children’s Anxiety Scale-parent version and child version | Children | Treatment: n = 16  Control group: n = 16 |
| Virtual interview training for autistic transition age youth: A randomized controlled feasibility and effectiveness trial (Smith et al., 2021) | Virtual interview training | Personal Report of Public Speaking Apprehension  (adapted anxiety scale) | Transition-age | Treatment: n = 48  Control group: n = 23 |
| Interview skills for adults with autism spectrum disorder: A pilot randomized controlled trial (Morgan, Leatzow, Clark, & Siller, 2014) | Interview Skills Curriculum | The Patient Health Questionnaire-9 (depressive symptoms) | Adults | Treatment: n = 13  Control group: n = 15 |

**Supplementary figure 1: Risk of bias assessment for CBT studies**

**Supplementary figure 2: Risk of bias assessment for SST studies**

**Supplementary figure 3: Forrest plot including RCTs on CBT for individuals from all ages with ASD and symptoms of anxiety**



**Supplementary figure 4: Forrest plot including RCTs on CBT for individuals from all ages with ASD and symptoms of depression**

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**Supplementary figure 5: Forrest plot including RCTs on CBT for individuals from all ages with ASD and symptoms of OCD**

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**Supplementary figure 6: Forrest plot including RCTs on SST for individuals from all ages with ASD and symptoms of anxiety**



**Supplementary figure 7: Forrest plot including RCTs on SST for individuals from all ages with ASD and symptoms of depression**



**Supplementary figure 8: Forrest plot including RCTs on CBT for children with ASD and symptoms of anxiety, subgroup analysis investigating individual vs group and combined CBT**



**Supplementary figure 9: Forrest plot including RCTs on CBT for children with ASD and symptoms of anxiety, subgroup analysis based on family involvement**



**Supplementary figure 10: Forrest plot including RCTs on CBT for children with ASD and symptoms of anxiety, subgroup analysis based on assessor of symptoms**

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**Supplementary figure 11: Funnel plot investigating publication bias for CBT studies**



**Supplementary figure 12: Funnel plot investigating publication bias for SST studies**



**References**

