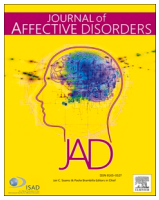
Journal of Affective Disorders 400 (2026) 121167

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad



Review Article

Identifying therapies to effectively reduce alexithymia: A systematic review and meta-analysis

Amber Mazza [a,c], Paige Davis [a], Lara Johnson [a], Fionnuala Larkin [b], Scott N. Cole [a,*]

[a] York St John University, School of Education, Language and Psychology, York, UK
[b] University College Cork, School of Applied Psychology, Cork, Ireland
[c] Leeds Teaching Hospitals NHS Trust, UK

ARTICLE INFO

Keywords:
Alexithymia
Psychological interventions
Meta-analysis
Transdiagnostic
Mental health disorders

ABSTRACT

Alexithymia is a multi-faceted construct that refers to difficulties with noticing and describing one's own emotional states, an externally oriented thinking style and constricted imaginal capacity. Here, we present a systematic review and meta-analysis of whether psychological interventions can reduce alexithymia compared to control conditions, and which intervention types are most effective. Following PRISMA guidance, this extensive search of databases resulted in 59 included studies, of which 53 effect sizes ($N = 3368$) were analysed with meta-analytic techniques. Overall, interventions significantly reduced levels of alexithymia compared with control conditions ($g = -0.52$ [SE = 0.09]), representing a medium-sized, average effect. Furthermore, moderation analyses indicated that integrative interventions had the largest effects, with minimal heterogeneity, with no differences found between psychological interventions that directly targeted alexithymia versus those that measured it as a secondary outcome. Included studies were mostly of good methodological quality. These findings increase theoretical and clinical knowledge of interventions for reducing alexithymia. Recommendations herein include conducting higher powered studies, recruiting more diverse groups, and developing a deeper understanding of the processes through which these interventions work.

Alexithymia is understood as a multi-faceted construct that primarily describes difficulties in (a) identifying emotions, (b) finding appropriate words to describe emotions and (c) an externally oriented thinking style (Bagby et al., 1994; Luminet and Nielson, 2025). Alexithymia is associated with problems in interpersonal relationships, emotional regulation, and physical and mental health difficulties including depression, anxiety, stress, suicidality and somatic symptoms (Bird and Viding, 2014; Hemming et al., 2019; Larkin et al., 2022; Li et al., 2015; Preece et al., 2024; Taylor et al., 1997). Therefore, finding ways to ameliorate alexithymia is important. Alexithymia presents challenges for engaging in psychological therapy, and currently, there are no well-established methods to reduce alexithymia using evidence-based psychological intervention (Pinna et al., 2020). Previous reviews of the literature have identified several potential interventions to reduce alexithymia, but firm conclusions on effectiveness have not been drawn. Recent reviews have not statistically compared interventions (Cameron et al., 2014; Tsubaki and Shimizu, 2024). While recent guidelines have been developed for intervention with clients presenting with alexithymia from a clinical perspective (da Silva, 2021), these recommendations are based on a subsection of the available studies and are not based on a systematic and comprehensive synthesis of the interventions available. The current study aims to resolve this knowledge gap by bringing together the available evidence on interventions for alexithymia (albeit in studies published in English).

In recent years, alexithymia has been recognised as a predisposing factor across a range of clinical and non-clinical populations, including *physical illnesses* (Gutiérrez Hermoso et al., 2020; Shibata et al., 2014; Williams and Wood, 2010), emotional processing difficulties observed in people with *developmental disorders* such as *autism spectrum disorder* (ASD) (Kinnaird et al., 2019; Poquérusse et al., 2018), and *psychiatric populations* (Berthoz et al., 1999; Bibby, 2016; De Panfilis et al., 2015; Gawęda and Krężołek, 2018; Guzzo et al., 2014; Honkalampi et al., 1999; Honkalampi et al., 2000; Maniaci et al., 2017; Nowakowski et al., 2013; Putica et al., 2021; Yehuda et al., 1997). Data from studies in the UK, Europe, and Japan suggest that alexithymia affects approximately 10% of the general population (Bird and Cook, 2013; Williams and Gotham, 2021). In clinical samples, such as those diagnosed with depression, anxiety, autism, eating disorders and schizophrenia, higher

* Corresponding author at: School of Education, Language & Psychology, York St John University, York, YO31 7EX, UK.
E-mail address: s.cole1@yorksj.ac.uk (S.N. Cole).

https://doi.org/10.1016/j.jad.2026.121167
Received 5 March 2025; Received in revised form 28 November 2025; Accepted 6 January 2026
Available online 10 January 2026

rates of alexithymia have been reported, with some studies estimating this as anywhere between 30 and 50% (McGillivray et al., 2017; Ng and Chan, 2020, Poquérusse et al., 2018; Westwood et al., 2017; Yi et al., 2023). However, prevalence studies are limited in the field of alexithymia, especially in non-WEIRD countries (Ryder et al., 2018). More studies are warranted due to the correlation of alexithymia with mental health diagnoses and how it may influence the expression of mental health symptoms, and the impact of cultural and sociodemographic factors on alexithymia (Pinna et al., 2020; Liu et al., 2025). Although its international incidence is relatively unknown, due to its effects on health, there is a need to understand and reduce the negative effects of alexithymia, potentially through interventions which are adjunctive or precursors to therapy for diagnosed health or mental health conditions, or as stand-alone treatments.

The current systematic review adopts a meta-analytic technique (Borenstein et al., 2009) within a systematic approach (Page et al., 2021) to (1) establish an updated synthesis on the effectiveness of psychological therapy for alexithymia, measured by a standardised effect size (hedges *g*); (2) assess which are most effective types of intervention and (3) examine moderators of these effects (e.g., primary/secondary outcome). Critically, this review will provide up-to-date evidence on the efficacy of psychotherapies for alexithymia using meta-analytic techniques, offering clinicians a more reliable basis for intervention planning.

1. Defining alexithymia

Alexithymia is a transdiagnostic construct that presents across a wide range of settings, in physical illnesses, psychiatric diagnoses and developmental disorders, as well as among the general population (Luminet and Nielson, 2025). Alexithymia was first identified in the context of psychosomatic illnesses (Sifneos, 1973), where clients were noted to exhibit cognitive and emotional characteristics, including difficulty identifying and verbalising emotions, reduced imaginative capacity and a thinking style that focused on external circumstances (now known as an 'externally oriented thinking style' (Bagby et al., 1994)). These difficulties inhibit the ability to communicate distress to others and restrict a person's ability to modulate emotions using fantasy, dreams, interests and imaginative pretend play (Taylor et al., 1997), all of which could be barriers for clients to fully benefit from psychological therapies.

Alexithymia is defined by these four core features. However, debate remains around what specific domains are impaired in the 'constricted imaginal capacity' facet (e.g. daydreaming frequency, the content of a daydream, or ability to use fantasy to regulate emotions) and whether it should remain a core feature in defining alexithymia. Preece and Gross (2023) have argued to remove this facet from the original model of alexithymia, in favour of their 'attention-appraisal model of alexithymia'. However, this proposal has been met with challenge from other prominent authors in the field, due to several limitations with the research used in studies cited to support this model (Taylor et al., 2024). Additionally, the validity of questions around this feature within psychometric measures (e.g. the original 26 item Toronto Alexithymia Scale; TAS-26; Taylor et al., 1985) have been questioned, leading to them being removed from most recent revisions of alexithymia measures, such as the TAS-20 (Preece and Gross, 2023). Luminet and Nielson (2025) highlight that although the EOT subscale of the TAS-20 was refined to capture constricted imaginal processes, there remains weak internal consistency within this subscale, and they recommend an additional measure of constricted imaginal processes to further understand the role this has in alexithymia. The TAS-20 remains the most widely used measure of alexithymia, and therefore the present meta-analysis is unable to assess the impact of psychological intervention on constricted imaginal capacity.

Alexithymia is not in itself a 'disorder' (Ogrodniczuk et al., 2011), but can be experienced at varying levels or intensities at certain points in an individual's life (Krystal, 1979), leading to the question of whether this is a stable and enduring personality trait, or variable state. Many current studies indicate alexithymia as a relatively stable trait, meaning that higher levels of alexithymia can be reduced through psychological intervention, however levels of alexithymia tend to remain elevated compared with the general population (Luminet and Nielson, 2025; Cameron et al., 2014). Alexithymia and its associated difficulties can be misunderstood as an 'all or nothing' categorical construct (Krystal, 1979), and having cut off scores in measures for alexithymia such as the TAS-20 (Bagby et al., 1994) is useful in indicating the level of severity with alexithymia symptoms. However, a continuum view is widely held within the literature where alexithymia ranges between high and low levels (Hogeveen and Grafman, 2021; Keefer et al., 2019; Parker et al., 2008).

What accounts for levels of alexithymia may be multi-faceted. Language impairment may be primary in some cases, influencing people's ability to identify and describe emotion concepts (Lee et al., 2022). Another proposal is that difficulty with interoception (e.g. sensing one's own physiology) may underlie alexithymia (Murphy et al., 2017). A distinction has been drawn between primary and secondary alexithymia (Messina et al., 2014): Primary alexithymia, or alexithymia that is developmental in nature, results from childhood psychic trauma, negative primary caregiver interactions and genetic differences (Goerlich, 2018). Secondary alexithymia develops in response to trauma experienced in infancy and throughout the lifespan, including sociocultural factors, and can be understood as a regression in affective function (Krystal, 1979; Goerlich, 2018; Helling, 2009). Messina et al. (2014) distinguish primary alexithymia as a possible vulnerability for mental ill health, and secondary alexithymia occurring as a consequence of experiences that may lead to this.

2. Reducing alexithymia: Clinical need and current evidence

Alexithymia in clients in psychological therapy has been associated with poor therapeutic outcomes (Grabe et al., 2008; Ogrodniczuk et al., 2011; Pinna et al., 2020) and negative reactions in the therapist (Ogrodniczuk et al., 2005). Hypotheses about how to approach therapy with alexithymic clients have been put forward since its conceptualisation. It was originally thought that dynamic therapies were unsuitable when working with clients high in alexithymia (Sifneos, 1973), due to reliance on the client's ability to access their emotions and make links with past experiences and their internal worlds. Supportive therapies, behaviour therapies, hypnosis and casework were deemed more suitable for clients presenting with these alexithymic-based difficulties (Sifneos, 1973).

Therapies that target interoceptive difficulties may also *indirectly* influence alexithymia. For example, Farb et al. (2015) refer to traditional practices such as yoga, tai chi and meditation along with therapeutic practices that integrate the link between mind and body, such as Acceptance and Commitment Therapy (ACT; Hayes et al., 1999), Dialectical Behavioural Therapy (DBT; Linehan, 1993) and Mindful Awareness in Body-oriented Therapy (MABT; Price, 2005). Whilst Farb et al. (2015) were exploring improvements in interoception only, a recent article by Shalev (2019) considers evidence that suggests a failure in different interoceptive processes can lead to alexithymia, and therefore reasons that integrating 'awareness-of-sensation' techniques in therapy such as 'focusing' and 'mindfulness', connecting body, mind and emotions, may help to improve aspects of alexithymia.

Cameron et al. (2014) conducted the first review of the literature in this area. They utilised a narrative review method, searching two databases for studies published in peer-reviewed journals (range: 1972–2012). The twenty-three studies that were included were organised by diagnosis and treatment setting, and included non-clinical populations. They concluded that alexithymia is partly modifiable using psychological interventions - while alexithymia scores can reduce over time, they remain elevated compared to the general population. Results

were inconclusive about which types of therapy were most effective due to the variability between included studies. However, a summary of clinical practice implications provided by Cameron et al. (2014) identified the following as potentially viable interventions to reduce alexithymia: *psychoeducation around affect*, *skills training*, *Cognitive Behavioural Therapy-based (CBT) interventions*, *group therapy*, *role-playing and non-verbal communication*, and *mirroring affective states (for example, empathic responses from the therapist to client material when indicating something may be of emotional significance, and reflecting back emotions they have observed in the client more overtly)*. This review has been extremely valuable in highlighting the importance of alexithymia, surveying the prevalence of empirical work and identifying initial therapies. However, narrative reviews are limited by their lack of transparency, subjectivity, and having no clear threshold for coming to conclusions (Borenstein et al., 2009). A more recent systematic review of 18 randomised control trials (RCT) targeting alexithymia (Tsubaki and Shimizu, 2024) found that a range of psychological interventions such as CBT, ACT, behavioural activation, schema therapy, and compassion-focused therapy (CFT, Gilbert, 2010) were effective at reducing alexithymia scores on standardised measures - however, this review was limited to only RCT studies, published between 2010 and 2024, and did not include a meta-analysis.

3. The current review

Fresh integration of the evidence base is needed to strengthen clinical recommendations. Therefore, a systematic review and meta-analysis was conducted, with attention to methodological rigour through the inclusion of risk of bias assessment and analysis of heterogeneity of effects. In the current meta-analysis, the principal aims were as follows:

1. To quantify the average effectiveness of interventions that target alexithymia compared to an appropriate comparator or control group (e.g., wait list control or active control).
2. To establish the moderating effect of (a) *intervention type*. In other words, are some types of intervention (e.g., CBT) more effective than others (e.g., psychodynamic)?
3. And (b) *outcome type*; where alexithymia is either a primary or secondary outcome

Based on previous literature, it was expected that there would be a large heterogeneity between studies (Cameron et al., 2014; Pinna et al., 2020), and as a result, we had no clear hypothesis regarding whether the average effect size across all included studies would represent a significant difference from control groups. It was hypothesised that studies aimed at increasing emotional awareness, balancing interoceptive functioning and increasing interpersonal effectiveness (e.g. CBT, psychoeducation, group and meditation-based therapies) would lead to larger reductions on alexithymia scores than other intervention types (da Silva, 2021; Shalev, 2019). It was expected that psychodynamic interventions, which rely on reflective processes that people high in alexithymia have difficulties with, would lead to the smallest effect sizes (Sifneos, 1973). In terms of outcome type, we predicted that interventions targeting alexithymia as a primary outcome would lead to greater reductions in alexithymia than interventions where alexithymia outcomes were secondary (Cameron et al., 2014).

4. Methods

4.1. Registration

This systematic review and meta-analysis was registered with the International Register of Systematic Reviews (PROSPERO; www.crd.york.ac.uk) on the 8th January 2021 (registration number: CRD42021221765) and follows the relevant aspects of the PRISMA guidelines for reporting systematic reviews and meta-analyses (Page et al., 2021). The present systematic review and meta-analysis received ethical approval from a University Committee on 30th November 2020.

4.2. Eligibility criteria

Eligibility criteria were decided following the PICO (Participants, Intervention, Comparator/Control group, Outcome) tool (Haynes et al., 1997). Studies eligible for inclusion in the review were studies involving adults with alexithymia who had received psychological therapy and implemented a between-groups design. This included, but was not limited to RCTs, non-randomised control trials and pre/post study designs. 'Adults' referred to anyone aged 18 or over. No upper age limit was imposed. Children were excluded from the present study as emotional and cognitive abilities are still developing, and interventions in this population need to be tailored to the child's developmental stage (Kirschman et al., 2009; Pavord and Burton, 2014, p. 157), and therefore may not be comparable to interventions applied to adult populations. Psychological therapy in this review refers to any psychological intervention, such as CBT, psychodynamic psychotherapy, or humanistic therapy, as well as interventions that have been developed based on psychological theory, for example, mindfulness, smartphone apps and writing tasks. To be eligible, studies had to measure alexithymia levels before and after intervention using a validated measure of alexithymia as either a primary or secondary outcome. Included studies were limited to those available in English and were not limited by search date. There were no limits on Journal sources, and grey literature was also searched to reduce publication bias. Exclusion criteria were: (a) psychopharmacology or medical intervention only, (b) previous narrative/systematic reviews, and (c) studies of children. Inclusion criteria following the PICO tool are presented in Table 1.

4.3. Information Sources

Database selection was conducted in collaboration with a University librarian to determine the most relevant databases. Databases used were as follows: AMED, PsychINFO, Cinahl, Medline, and Cochrane Central. Ebscohost was the primary research platform used to search these databases, as well as Cochrane Central. Grey literature was also included, and reference lists of previous reviews of alexithymia were examined for relevant references that may have been missed by the search strategy. Google Scholar was used to hand search for study protocols that may have since been published following identification in the screening process. For the initial search, EBSCOhost was last searched on 25th November 2020, and Cochrane Central on 17th December 2020. An updated search of these databases was also completed from December 2020–November 2022 to include more recent publications. No hand

Table 1
Inclusion Criteria for the Systematic Review and Meta-analysis.*

PICO	Inclusion Criteria
Participants	Adults with levels of alexithymia (measured using any validated alexithymia measure, such as the TAS-20) who have received psychological therapy/intervention. Co-morbid diagnoses will not exclude participants.
Interventions	Any therapeutic intervention (such as CBT, humanistic therapy, psychodynamic psychotherapy etc), as well as interventions that have been developed based on psychological theory (e.g., mindfulness-based interventions, smartphone apps, therapeutic writing tasks).
Comparators/ controls	Alternative active treatments (e.g., standard care, including medication alone or an alternative psychological intervention) and no active treatment (e.g., passive/wait list control).
Outcomes	Change in alexithymia score from baseline to most recent follow up (measured using a validated measure of alexithymia such as the TAS-20, TSIA, BVAQ).

* Note. TAS-20 (Bagby et al., 1994), BVAQ (Vorst and Bermond, 2001), TSIA (Bagby et al., 2006).

searches were conducted during the second search.

4.4. Search

Search terms were structured using the concept of alexithymia followed by the overarching intervention types and then outcome. The final search strategy was the same in both EBSCOhost and Cochrane Central although Boolean search modifiers were adjusted to reflect the differences in symbols used by each platform. Final search strategies are reported in Table 2

4.5. Study selection

The study selection process is highlighted in Fig. 1. Abstracts identified from the final search strategy were downloaded into EndNote, a reference manager software, and imported into RAYYAN (http://rayyan.qcri.org; Ouzzani et al., 2016). The screening of abstracts for this review was completed independently, by two co-authors (AM and LJ) applying the eligibility criteria discussed above. Combining both searches, 1283 abstracts in total were screened following removal of duplicates. Where disagreements arose in whether to include or exclude an abstract, discussions were had with the other co-authors to resolve this. Following abstract screening, 295 full texts were assessed for eligibility by both researchers independently. There was an 85% agreement rate between screeners at full-text screening stage ($\alpha = 0.92$), indicating excellent inter-rater reliability.

5. Data analysis plan

5.1. Data extraction

Data were collected independently by two co-authors (LJ and AM) from each of the final full-text papers included in each study, by going through each full text by hand and entering data into an extraction sheet, developed in Microsoft Excel. This extraction sheet covered the items detailed below in the 'Data Items' section. No automation tools were used at this stage. A trained postgraduate researcher then calculated mean gain scores for the intervention group and the comparator/control group.

5.2. Data items

Information was extracted from each study (where reported) on: (1) *participant characteristics* (including sample size, mean age, gender ratio, ethnic origin, diagnosis, treatment location, mean alexithymia score) and the studies' participant inclusion and exclusion criteria; (2) *intervention* (including intervention type, duration, frequency, mode of delivery, location of intervention and who delivered the intervention); (3) comparator and control group type (4) *measure of alexithymia* (including validated self-report or clinician rated measures such as the TAS-20 or the TSIA, follow up duration, measured as primary or secondary outcome, what the primary outcome was if not alexithymia, means and standard deviations for each group at pre-test and most recent follow up post-test score). Further information was extracted regarding the *study type* (including but not limited to RCT, non-RCT, pilot study, longitudinal study), and whether the research was peer reviewed or from the grey literature. Finally, mean gain scores were calculated based on data extracted above, and Hedges' *g* (an effect size that adjusts for small sample sizes) was calculated to estimate the effect size of each intervention.

Table 2
Search Strategies in Each Platform.

Platform	Search Strategy
Ebscohost	Alexithymi* AND (CBT OR therap* OR psychotherap* OR interven* OR Counsel#ing OR Treatment) AND (efficacy OR effective* OR improv* OR reduc* OR chang*)
Cochrane Central	Alexithymi* AND (CBT OR therap* OR psychotherap* OR interven* OR Counse?ing OR Treatment) AND (efficacy OR effective* OR improv* OR reduc* OR Chang*)

5.3. Quality assessment

During the pre-registration phase of this systematic review and meta analysis, it was intended that a combination of the Cochrane risk of bias checklists: RoB 2 (Sterne et al., 2019) and ROBINS-I (Sterne et al., 2016), would be used to assess risk of bias in the present study. However, it became clear when reviewing the studies included that these checklists would not capture the broad range of methodologies used by studies included in this review. Therefore we deviated from this plan and used a checklist that assesses a more varied range of study designs (Kmet et al., 2004). As can be observed by the Quality Assessment coding (see *Supplementary Materials*), studies varied as to the quality ratings, although most had a medium-high rating of quality (most were over 70%), as determined by the extent they met quality standards across fourteen methodological areas (Kmet et al., 2004).

As systematic reviews and meta-analyses exist to provide a rigorous synthesis of the available research, it is therefore important to address the presence of potential bias to ensure conclusions reflect the true findings and not systematic biases. The funnel plot presents the standard error (y-axis) against the observed effect sizes (x-axis). Dots on the funnel plot represent each study, and the dotted lines represent the 95% confidence interval around the mean assuming effects will cluster around the mean with greater precision (lower Standard Error[SE]). Symmetry within the funnel plot indicates no evidence of bias, and asymmetry suggests bias. In addition to the funnel plot, Egger et al. (1997) regression test was used to assess studies for bias. Low *p* values indicate asymmetry.

Visually, the funnel plot (Fig. 2) below can be observed as somewhat symmetrical- indicative of a positive correlation- whereby lower precision studies (higher SE) had larger effects of the intervention (observed as larger negative effect sizes). The Egger's test in the present study were $t = -2.87$, $p = .006$ (intercept = −1.55 [−2.64, 0.47], slope = −0.02 [−0.29–0.32]), indicating evidence of asymmetry in the present study due to publication bias. Therefore studies with larger N sizes (hence lower SE) led to smaller effects of the interventions than those with smaller N sizes, indicating 'missing' smaller studies with null findings.

Synthesis of Results.

Outcome measures used to measure the change in alexithymia scores provided continuous data. There were variations in the outcome measures used in each study, the data reported, and statistical analyses used to calculate effect sizes across studies. Effect size and variance estimates were obtained with the Campbell Collaboration effect size calculator (Wilson, 2023) using Pre and Post Means and SDs (for experimental and control group), and sample size using pre-test *and* post-test SDs to calculate the pooled within-groups standard deviation (except one study where only post-scores were available). Where Means were not available, but articles stated a non-significant effect of the intervention, effect size was set at zero ($n = 3$), with variance estimated using Meta-Essentials (Suurmond et al., 2017). When there were several experimental groups in a single study, each effect compared to the same control group was calculated, dividing the *N* of the control by the number of experimental groups, in line with recommendations by Higgins and Green (2011). In studies with multiple timepoints, only the farthest follow-up test was used (to ensure conservative estimates). When necessary effect size estimate data was missing, and study authors did not respond to data requests ($n = 7$ or 11% of studies), the effect size for that study was not included. However, all studies are available in *Supplementary Materials*.

A positive effect size indicated an increase in levels of alexithymia in the intervention group compared with the control group, and a negative

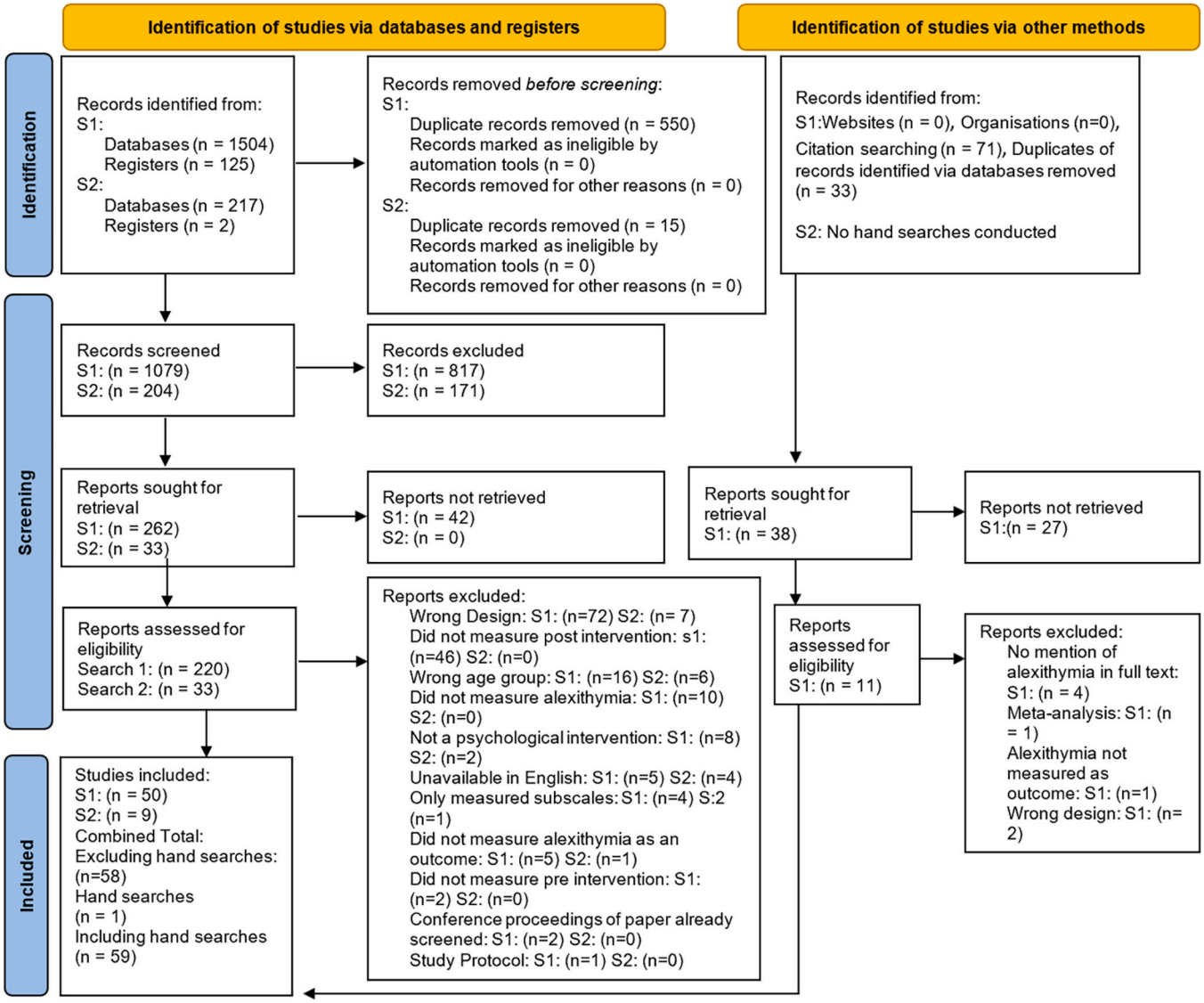


Fig. 1. PRISMA (2020) flow diagram illustrating the study selection process.
Note: It should be noted that four studies (de Groot et al., 1995; Grabe et al., 2008; Porcelli et al., 2011; Stingl et al., 2020) were excluded after official screening due to not meeting study design criteria upon further inspection and discussion with the wider research team. S1 = Initial Search and S2 = Second Search. See Page et al. (2021) for updated PRSIMA framework.

effect size indicated a reduction in alexithymia, favouring the intervention group compared with the control group: Thus, beneficial interventions, reducing alexithymia, were reflected in negative effect sizes. Statistical analysis of effect sizes, heterogeneity was calculated using Meta-Essentials (Suurmond et al., 2017). Figures were produced using the MAJOR package on JAMOVI (The Jamovi Project, 2024). A classical meta-analysis using a random-effects model was chosen to apply to the present study. Random-effects models are generally preferable when conducting meta-analysis in the social sciences, due to the assumption of a natural heterogeneity within each study (Borenstein et al., 2009).

Heterogeneity refers to the variation in the true effect sizes of a meta-analysis, taking into consideration within-study error (Borenstein et al., 2009). Heterogeneity was calculated using both the Q statistic and the I^2 statistic. High Q statistics alongside statistically significant *p* values indicate the likelihood of higher levels of heterogeneity. Markers of heterogeneity using I^2 have been proposed as 25%, 50% and 75%, indicating low, medium and high heterogeneity, respectively (Borenstein et al., 2009). This was followed by subgroup analyses to determine reasons for heterogeneity. Restricted Maximum Likelihood (REML) was chosen as the most appropriate random effects model of heterogeneity to use.

The overall mean effect size across all studies was calculated, and then subgroup analysis was conducted based on intervention type to observe whether any model of therapy could be identified as most effective. Consideration was also given to whether alexithymia was targeted as a primary outcome, or measured as a secondary outcome as a potential moderating factor. Qualitative information describing each study was also extracted and is presented in *Supplementary Materials*. Aggregate data from each of the studies were extracted, including descriptive statistics and an indication of the efficacy of the intervention.

5.4. Coding of subgroups

Potential subgroups were identified prior to data extraction, based on the research team's knowledge of different therapeutic approaches and familiarity with the included studies gained from the study selection process. These were refined as the data extraction process unfolded to

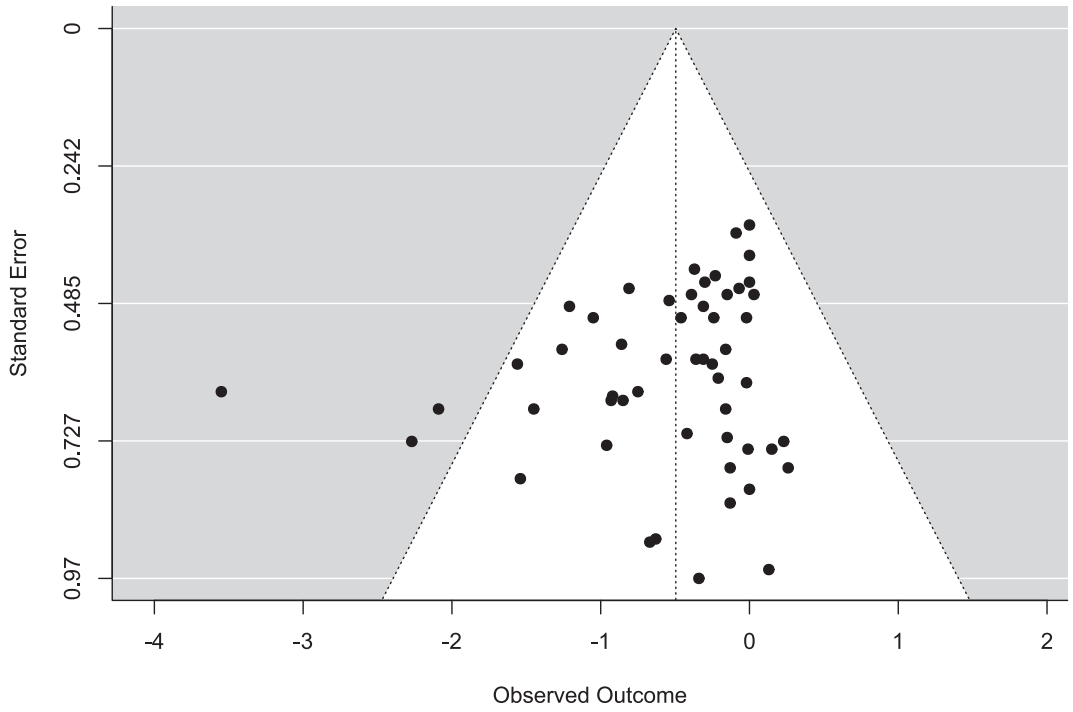


Fig. 2. Funnel plot of effect sizes presented as a function of standard error.

represent intervention types specified by each included study. Where it was unclear, discussions took place with the research team to facilitate the decision. Although it would have been of interest, studies could not be categorised based on mental or physical health diagnoses (e.g., social anxiety disorder), because many of the included studies tested groups of individuals with a variety of health difficulties. Studies were grouped by overarching intervention type/theoretical basis for the primary intervention group and not control group intervention. The final intervention groups identified were: *Art therapies, CBT and third wave interventions,*[1] *Expressive writing interventions, Integrative interventions, Meditation-based interventions, Multimodal interventions, Psychodynamic interventions, Psychoeducation interventions, Alternative interventions*[2] and *Humanistic interventions.*

6. Results

6.1. Characteristics of included studies

The included studies yielded 59 independent studies for the systematic review. 53 independent effect sizes extracted from 47 studies were included in the meta-analysis. Study characteristics are presented in *Supplementary Materials*, organised into their respective intervention subgroup categories.

6.2. Systematic review (59 studies)

Within the studies, there were 4809 participants in total. Sample sizes ranged from 10 to 386. The mean sample size was: 81.51 (median: 142;mode: 40). Mean ages were combined from included studies where these data were available (all but 6 studies) $M = 35.35$ ($SD = 10.94$) years. Sample populations varied with regards to primary diagnosis (e.g., depression, burnout, cancer, borderline personality disorder). Twelve studies used nonclinical samples, and the remaining clinical samples included participants with multiple, varied diagnoses. Of the included studies, only 14 reported data on race and ethnicity for the final sample. Of these studies, 73% of participants identified as White/Caucasian/European American, 9% as Black/African American, 5% as Hispanic/Latino, 3% as Indian, 3% as Asian and 6% were ethnicities that were either not reported or described as 'other'. Studies were conducted in Europe ($k = 28$), North America ($k = 15$), Asia ($k = 12$), Europe/Asia ($k = 3$) Australia ($k = 1$).

Of the included studies, 9 were from the grey literature (all doctoral theses), and 50 were published in peer reviewed journals. All of the included grey literature studies were from PhD theses originating from American ($k = 8$) or Swedish ($k = 1$) universities. All included studies were published between the years 1995 and 2022. Designs ranged widely in the group of studies included where; 43 studies used randomised designs, 7 of which were pilot/feasibility studies. Of the non-randomised studies, there were 6 quasi-experimental non-randomised controlled studies, 5 pilot studies, 2 longitudinal studies, 1 naturalistic study, 1 field study and 1 case series. Of the included studies, 32 measured alexithymia as a primary outcome, 26 as a secondary outcome and 1 as a tertiary outcome. Control/comparator conditions varied, where 21 studies used active control groups (e.g., a specific intervention designed for the study), who underwent alternative intervention conditions, and no treatment control groups were also utilised in 11 studies. Waitlist control groups were used by 9 studies, and 16 studies used treatment as usual (TAU) control groups (e.g., standard CBT, medication). Finally, one study used a healthy comparison group alongside 2 intervention groups, and 1 study used both an active and a no-treatment

[1] Third wave CBT interventions refer to interventions based on psychological therapies such as ACT, CFT or DBT, for example.

[2] This included interventions that did not fit into other categories, including Body based interventions, such as yoga, hypnotic imagery, and neurofeedback, and a positive psychology intervention. Grouping hypnotic imagery with meditation-based interventions was briefly considered, however there are unique differences between the two in terms of how each activity is undertaken, the focus on sensory processing and the element of suggestibility required in hypnosis interventions (Halsband et al., 2009).

control group. The most frequent measure of alexithymia was the TAS-20 ($k = 50$), followed by the original TAS-26[3] ($k = 5$) then the BVAQ self-report version ($k = 1$), SSPS ($k = 1$), NMAS ($k = 1$), Ahvaz Alexithymia Scale (AAS-26) ($k = 1$). Please refer to *Supplementary Materials* for tables including a breakdown of each included study.

6.3. Meta-analysis

6.3.1. Overall effect of psychological intervention on alexithymia

The results of this random effects meta-analysis are presented as a forest plot in Fig. 3. This plot includes the 53 effect sizes (from 47 studies) included in the meta-analytic components of this review. The weighted average effect size of all included psychological interventions ($k = 53$, $N = 3368$) was $g = -0.52$ [95% CI, −0.71, −0.34, SE = 0.09], $z = -5.67$, $p < .001$,[4] indicating that reducing levels of alexithymia in psychological therapy is achievable, with a small-medium effect size. The results indicate substantial levels of residual heterogeneity across all studies $Q = 188.18, p < .001, I^2 = 72.37\%$. This indicates that the overall weighted average effect score should be interpreted with caution, and subgroup analysis and analysis of potential moderators need to be explored. All data is openly accessible on the open science framework (Cole, 2025, osf.io/xnhcp).

6.3.2. Comparison of intervention subtypes

In Table 4, we present the weighted effect sizes for each intervention type excluding *alternative* (due to $k = 1$) and *multimodal* (k = 0 with sufficient data). This can allow one to conclude that certain intervention types are deemed effective compared to the control group (this is indicated by a negative effect, and an upper bound Confidence Interval not crossing zero, see Cole et al., 2021 for a similar approach). We examined seven subgroups, which contained 3–14 effect sizes in each (52 effect sizes, and overall $N = 3328$). The most common intervention type was *CBT and third wave interventions* followed by *Psychoeducation* (see Table 4).

Results indicated that interventions that integrated theories from different modalities (*Integrative*) led to large estimated effect sizes ($g = -0.69$). All remaining intervention types had a moderate effect on alexithymia except meditation-based interventions which had a small effect size ($g = 0.14$, see Table 4).

Residual heterogeneity within *CBT and third wave interventions*, *Integrative*, *Psychodynamic* and *Psychoeducation* subgroups was indicated to be significant by the *Q* statistic indicating that these effect sizes cannot be interpreted as if they were one single group of effects. In sum, some intervention types seem to be more effective than others, with an overall moderation effect, *QM (6)* = 10.10, $p = .12$, which was not statistically significant. In sum, it appears that all interventions tend to decrease alexithymia compared to a control group, with *CBT and third wave interventions* and *Integrative* therapies having the large-sized effects, and *Arts therapy* having a medium-sized effect. All other therapies had somewhat positive effects but had 95% confidence intervals crossing zero suggesting they are less effective.

6.3.3. Comparison of alexithymia measured as a primary or secondary outcome

Subgroup analysis was also conducted on whether the study measured alexithymia as a primary or secondary outcome (Table 4), and if this produced different effect sizes. Effect sizes in each subgroup

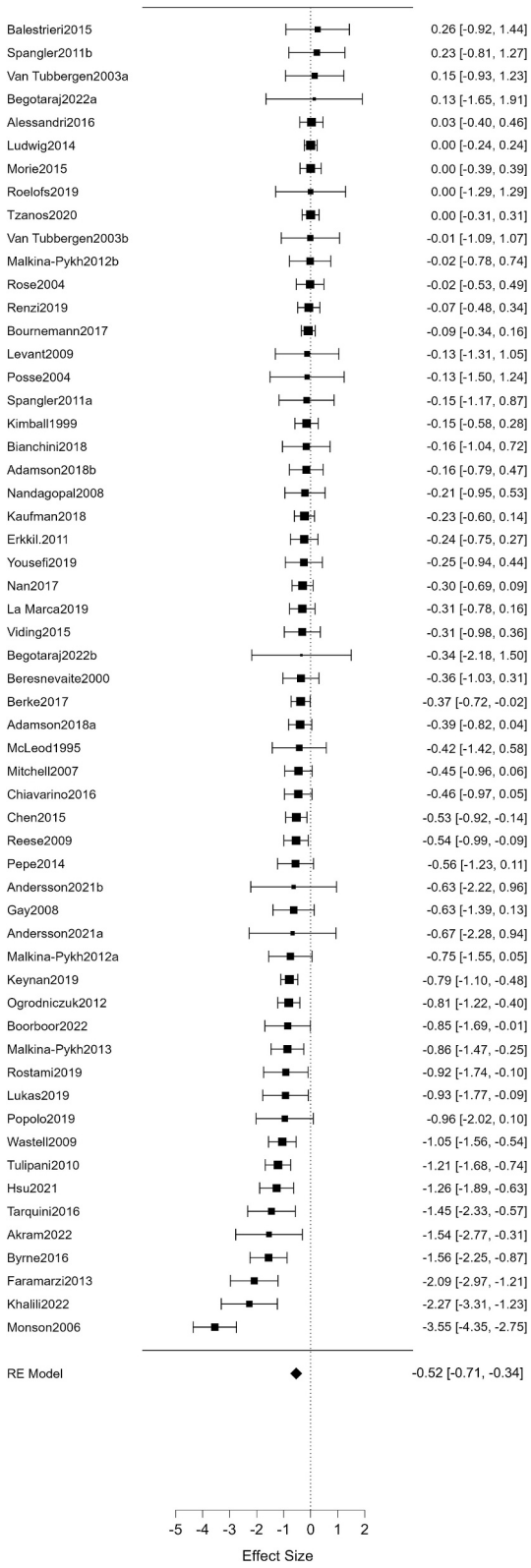


Fig. 3. Forest Plot showing estimates of individual and overall effects sizes for alexithymia interventions compared with a control condition.
Figure Note: In this plot, individual effect sizes for interventions are represented by black squares, and the error bars represent standard error (presented in order of effect size). The numerical effect sizes and 95% confidence intervals are presented on the right hand side of the Figure. Below, the overall effect size estimate can be observed, illustrated by a diamond. The dotted line represents zero effect.

[3] Due to measurement issues previously identified by the creators of the TAS-26, caution should be used when interpreting articles using this measure.

[4] We re-analysed the main meta-analysis without the 3 effect sizes set at zero (due to insufficient data reported). This slightly increased the overall effect size but did not change the nature of the effect (i.e., with or without it is still significantly different than zero). The statistics without these three null effects was $g = -0.56$, $z = -5.82$ $p < .001$.

Table 4
Subgroup analysis of intervention types.

Subgroup	K (N)	Effect Size Estimate (g)	*QE*	*QM*	*p*	Lower bound 95% CI (g)	Upper bound 95% CI (g)
Intervention Type				10.10	0.12		
Arts Therapies	6 (331)	−0.38	4.67			−0.67	−0.09
CBT and third wave interventions	15(913)	−0.66	79.74*			−1.14	−0.18
Expressive writing	8(431)	−0.28	11.08			−0.63	0.07
Integrative	6 (370)	−0.69	12.32			−1.15	−0.22
Meditation	3 (437)	−0.14	0.73			−1.17	0.797
Psychodynamic	7 (618)	−0.42	29.58*			−1.18	0.34
Psychoeducation	7 (203)	−0.46	18.36*			−1.17	0.25
Outcome Type				0.67	0.41		
Alexithymia-as-Primary	26 (1580)	−0.52	72.98*			−0.75	−0.29
Alexithymia-as-Secondary	26 (1861)	−0.41	51.50*			−0.59	−0.23

Note: QE indicates remaining heterogeneity in subgroups, with a * indicating significant heterogeneity at the $p < .05$ level. QM indicates the omnibus test for the moderation effect, which was performed with tau separately for subgroups. With tau calculated separately for subgroups, caution must be taken interpreting subgroups with few observations ($2 < k < 5$ and $50 < N < 500$). Only one effect size related to the intervention type "Alternative" so this was not included in the moderation analysis.

remained similar (Primary outcome: g = −0.52, Secondary outcome: g = −0.41), however residual heterogeneity remained substantial in both groups (see Table 4). Only one effect size was associated with tertiary outcome and was therefore not included. The moderation analysis involved $k = 52$, $N = 3441$. The statistical effect of subgroup was not significant ($QM = 0.67$ (1), $p = .41$), hence we conclude that there was substantial heterogeneity within each subgroup and that no meaningful differences existed between the effects sizes in experiments using alexithymia as primary or secondary variables.

6.3.4. Exploratory subgroup analyses

Although not part of our preregistered hypotheses, to provide a sensitivity analysis (common in meta-analyses, e.g., Jiménez-Orenga et al., 2025), we conducted three exploratory subgroup moderation analyses, examining study quality (high, moderate), randomisation (yes, no), and duration of intervention (number of sessions, continuous variable, range 1–208). We also examined whether the effect was dependent upon the subcomponent of Alexithymia assessed. Study Quality was coded as 'high' if studies were rated 75% or more for quality on the Quality Assessment coding (Kmet et al., 2004). All other studies were classed as 'moderate', rated 50–74%. We used ratings of 1 or 2 on question 5 of the Study Quality measure to code each study as 'randomised', and 0 or n/a as 'non randomised'. Note that although duration was measured with session frequency, time duration per session varied across studies.

To summarise these analyses, even though high quality studies led to larger, and more reliable, intervention effects than moderate quality studies (−0.54 versus −0.40), there was no significant moderator effect of study quality ($p > .05$, see Table 5). For randomisation, as expected from meta-analytic theory, studies with stricter randomisation procedures garnered more modest effects (−0.50 versus −0.62), however, the moderation test was not significant. Thus, randomisation, the gold standard of intervention procedures, did not have a substantial effect on the meta-analytic effect. Indeed, when non-randomised studies were removed, the overall effect remained significantly different than zero ($z = -4.63$, $p < .001$). Similarly, duration of intervention measured by number of sessions did not have a significant moderation effect on effect sizes ($\beta = 0.09$, $z = 0.67$, $p = .51$).

Additionally, we ascertained how many studies had sufficient data to calculate effects as a function of the three facets of Alexithymia, resulting in 16 effect sizes. Using the same techniques to calculate our main meta-analysis, we found the following: *difficulty identifying feelings*, Hedges $g = -0.06$, $p = .43$, $Q = 77.15$, $p < .001$; *difficulty describing feelings*: Overall Hedges $g = -0.39$, $p < .001$, $Q = 44.18$, $p < .001$; *externally oriented thinking*: Overall Hedges $g = -0.45$, $p < .001$, $Q = 36.65$, $p < .001$ (all one-tailed, $k = 16$, $N = 1215$). Based on this subset, it suggests interventions are effective for changing externally oriented thinking and difficulty describing feelings, but not effective in changing difficulty identifying feelings.

7. Discussion

The contribution of the current review is to provide a rigorous and pre-registered review of the efficacy of psychological interventions upon alexithymia, using standard and reliable meta-analytic techniques (Borenstein et al., 2009). Concerning our primary aim, this meta-analysis found that, overall, interventions are able to significantly reduce levels of alexithymia compared with (passive, treatment as usual or active) control conditions. This is consistent with several reviews of the literature (Cameron et al., 2014; Ogrodniczuk et al., 2018; Luminet and Nielson, 2025). Substantial heterogeneity in effects were found, as expected. Heterogeneity was explored with moderator analyses.

Concerning which interventions "work best", based on previous literature, it was hypothesised that psychoeducation, CBT, and meditation-based therapies would lead to larger effect sizes. This hypothesis was partially supported by the present systematic review and meta-analysis. Despite showing medium effects at reducing alexithymia compared with controls, CBT and third wave interventions, psychodynamic interventions and psychoeducation had significant heterogeneity, making meaningful conclusions on their overall impact difficult. Small

Table 5
Statistics for Exploratory Subgroup Analyses.

Subgroup	K (N)	Effect Size Estimate (g)	*QE*	*QM*	*p*	Lower bound 95% CI (g)	Upper bound 95% CI (g)
Study Quality				0.55	0.46		
High	47 (3087)	−0.54	179.62*			−0.75	−0.34
Moderate	6 (287)	−0.40	8.46			−0.83	0.04
Randomisation				0.38	0.54		
Randomised	42 (2480)	−0.50	149.33*			−0.71	−0.28
Not Randomised	11 (888)	−0.62	37.60*			−1.02	−0.21

Note: See Note for Table 4.

effect sizes were observed in most of the remaining intervention subtypes, however a large effect size was observed for integrative therapies, indicating that integrative therapies were more effective at reducing levels of alexithymia than unimodal therapies. Unexpectedly, the meditation-based intervention subgroup produced the smallest effect size. A word of caution however is the non-significant finding for the overall moderation effect. However, there are several possible reasons for not finding overall moderation effects in meta-analyses which will be discussed below (Cuijpers et al., 2021). These results will be discussed below alongside a synthesis with current theoretical perspectives and empirical findings from this review and extant studies.

In terms of our third aim, due to substantial levels of residual heterogeneity, overlapping confidence intervals, and a lack of significant difference, it is challenging to make firm conclusions regarding the effectiveness of targeting alexithymia as a primary or secondary outcome in interventions. Interventions can be effective regardless of how alexithymia is targeted. It can also be assumed that other variables such as intervention type exert a larger moderating impact on effectiveness of reducing alexithymia than outcome type (primary or secondary).

Exploratory analyses revealed that neither study quality, randomisation nor number of sessions exerted a significant effect on the effect sizes. Finally, based on a subset of studies, it was found that interventions were only able to change externally oriented thinking and difficulty describing feelings, but not effective in changing difficulty identifying feelings. Although firm conclusions cannot be drawn from this limited and varied pool of effects, future research may benefit from differentiating intervention effects on facets of alexithymia.

7.1. Relation to the wider literature

Research into psychological therapies more widely has highlighted that while there is evidence to say psychological therapies are effective, it remains largely unknown why and how this is, despite many mechanisms of change being proposed (Kazdin, 2009; Leichsenring et al., 2018b; Zilcha-Mano, 2021). Different types of therapies have unique underlying theories as to what they believe facilitates therapeutic change. For example, client-centred therapy hypothesises that change can be observed by using the therapeutic relationship to facilitate the client to access their own capacities for change and growth (Rogers and Fuchs, 2021), and ACT approaches hypothesise that working with a client to increase psychological flexibility can help them to facilitate change (Harris and Hayes, 2019).

In the present review, the studies included in the integrative interventions subgroup (Adamson et al., 2018; Beresnevaite, 2000; Popolo et al., 2019; Tulipani et al., 2010; Wastell et al., 2009) yielded a large effect size ($g = -0.94$). When explored in more depth, three of these studies used group interventions, two of which were specifically targeting alexithymia. Interestingly, Adamson et al. (2018) compared a group vs individual version of a cognitive remediation and emotion skills training (CREST), and found that the group that received the individual format of this intervention experienced a significant reduction in alexithymia whereas the group that received the group format of the intervention did not. They identified that this could be due to the individual format of the intervention having a higher number of sessions (8 sessions, vs 5 sessions for the group intervention), which could be more tailored to the individual's needs.

Each of the interventions within this subgroup appeared to integrate interventions with similar underlying mechanisms of change. This included providing a safe therapeutic relationship, facilitating relationships between group members and providing opportunities to mirror other group members using experiential exercises where a group intervention was delivered, incorporating psychoeducation and body-based exercises, and promoting awareness of participants' internal processes, thinking styles, emotions and mental states, and the ability to communicate this to significant others. This supports recommendations put forward within the wider literature that propose that interventions should contain elements of psychoeducation, emotional and social skills training, experiential exercises, attending to the therapeutic relationship and integrating group therapy with one-to-one therapy where possible (Cameron et al., 2014; da Silva, 2021; Krystal, 1979; Sifneos, 1973). An important sidenote is to highlight that intervention duration and frequency varied between studies (see Supplementary Materials). This variation was not the focus of this review, but may be an important factor, alongside intervention type, in determining intervention efficacy.

It was considered that some of the included integrative studies directly targeted alexithymia and that doing so this may be the key element of effectively reducing alexithymia in psychological therapy. However, studies within other subgroups that yielded small effect sizes, such as expressive writing interventions, also created interventions to target alexithymia, so this does not satisfactorily explain why a larger effect size was observed within the integrative intervention subgroup. Additionally, intervention studies measuring alexithymia as a secondary outcome also observed reductions in alexithymia, so therefore this explanation cannot fully account for the difference in effect sizes between subgroups.

Interestingly, a small effect size was observed in mindfulness-based interventions. This contrasts with Norman et al.'s (2019) meta-analysis of mindfulness-based interventions to reduce alexithymia, which found a moderate effect size. This could be due to differences in the included studies. Norman et al. (2019) included one study which was not available to the present reviewer and another that was not included due to deviating from the present review's search terms. They also included Viding et al. (2015) as a mindfulness intervention, a study which included a combination of mindfulness and arts-based interventions. Additionally, the present review included Kaufman and Jensen (2018), Norman et al. (2019) did not. Due to the larger emphasis on art-based interventions, this was deemed to be more appropriately categorised in the present study under ‘arts therapy’. This could explain, at least in part, the differences in effect size estimates for this subgroup compared with the study by Norman et al. (2019).

When taken in the context of the wider psychotherapy literature, there are increasing movements toward integrative and pluralistic practice alongside requirements for each of the psychotherapeutic disciplines to demonstrate rigorous empirical evidence for their approach (Castonguay et al., 2015; Leichsenring et al., 2018a). The movement toward theoretical integration is based on the notion that ‘one size does not fit all’ (Leichsenring et al., 2018a), and that different people need different things at different times (Cooper and McLeod, 2007). Cooper and McLeod (2007) argue that an orientation-based view of counselling and psychotherapy is prevalent in the UK, where there have been extensive difficulties finding that one approach is more effective than another. For example, Leichsenring et al. (2018a) argue that although there is a prevailing view that CBT is a ‘gold standard’ mode of therapy based on the empirical research into the therapy, there are methodological issues within this body of literature, including that many studies do not compare CBT to another *active* control group: A large proportion of studies into CBT utilise a waitlist control. Taking an integrative view, it can be understood that all theorised mechanisms of change in therapy can be effective depending on the client's goals, needs and wishes (Cooper and McLeod, 2007). Wakefield et al. (2020) highlight that psychotherapists often work with diverse populations who often have multiple presenting difficulties, and that integrative practice is essential in this context. They consider that there are multiple levels to successful therapy (such as biology, neuroscience, behaviourism, cultural meaning, and family systems, among others), and where singular approaches to therapy may target some of these, integrative practice can address multiple levels that may be contributing to a person's presenting difficulties. Outside alexithymia, there is evidence to suggest multimodal or integrative approaches to therapy are effective for a range of presenting problems, such as metacognitive therapies (Philipp et al., 2018), schema therapy (Peeters et al., 2021), and cognitive analytic therapies (CAT;

Ryle, 1985; Hallam et al., 2021). It is perhaps unsurprising therefore that integrative therapies had larger effect sizes within the present review.

Whilst remaining important elements of intervention, subgroup analysis highlighted that interventions such as arts interventions, expressive writing and meditation-based interventions, when provided alone, did not observe effect sizes as large as studies included in the integrative therapies category (indeed, the latter two intervention types had effect size confidence intervals that included zero). This further supports the notion that integrating these elements into therapy is more effective than applying one treatment approach alone. Whilst effect sizes were small across these intervention types, the results of this review suggest that arts interventions, expressive writing, meditation and body-based interventions may still be effective in improving alexithymia and emotional clarity. Alexithymia is a transdiagnostic construct, and so it may be that rather than replacing disorder-specific treatments to specifically focus on alexithymia in psychological therapy, techniques such as mindfulness could be successfully integrated alongside to improve emotional functioning (Cooper et al., 2018). This may be more feasible for clients who may have presenting difficulties that take priority over alexithymia for the focus of psychological interventions.

Considering points made by Wakefield et al. (2020) regarding different levels to mechanisms of change, it is possible that in the present research, integrative interventions were more effective as they captured a broader range of mechanisms of change than studies using a singular therapeutic approach. It could be that integrative interventions were more likely to meet the needs of each individual included in the study, whereas other interventions such as expressive writing approaches may only have been meeting the needs of some of the participants within the included study. One clinical implication of this research would seem to be that rather than trying to establish specific treatments for alexithymia as has been proposed (Cameron et al., 2014; Pinna et al., 2020), it is important to be practice-led and apply a range of interventions flexibly and responsively to the diverse needs of clients that present with higher levels of alexithymia, using a case formulation approach incorporating the knowledge of what has already been established in the literature to guide practice (da Silva, 2021).

7.2. Limitations

Caution is recommended when interpreting these results, as the articles identified by the search yielded heterogeneous samples in terms of treatment setting and participant characteristics, and that whilst interventions within each category can be linked due to being embedded within distinct theoretical paradigms, implementations of intervention types varied (e.g., CBT and third wave interventions, arts therapies, psychoeducation). Although this is a limitation of the present review, this variation of participants is consistent with real world practice (and indeed most systematic reviews). As alexithymia is not a diagnosis, but a subclinical construct that presents over both clinical and subclinical populations, it would be difficult to isolate alexithymia and study it separately, and the current research in this field reflects that by studying it alongside other constructs (Luminet and Nielson, 2025). Additionally, in practice, no two experiences of therapy would look the same.

It is important to consider additional limitations of the studies included. The difficulties associated with alexithymia involve interpersonal functioning (Vanheule et al., 2007; Vanheule et al., 2010), and therefore need to be understood through a cultural lens, as what might be viewed as acceptable in terms of communicating emotionally may vary across cultures and populations (Wong et al., 2008). Most of the included studies either did not report on participant characteristics such as race or ethnicity and of those that did, the majority of participants were White/European/American. The wider alexithymia literature is limited with regards to culture, and so more research is needed on whether this is a construct that applies cross-culturally or is something that is viewed as a deficit only through a western lens. This is a problem within psychology research more broadly, in that many published samples involve Western, educated, industrialized, rich and democratic (WEIRD) participants (Henrich et al., 2010).

Additionally, although the included literature spans a wide variety of clinical populations, samples including those with longer term psychological difficulties such as schizophrenia or severe mood disorders were limited, and none of the included studies examined interventions with autistic participants. This is an important area for future research, given the substantial literature supporting the hypothesis that socio-emotional difficulties that are commonly misunderstood to be a feature of ASD are instead better explained by co-occurring alexithymia (Aaron et al., 2015; Bird et al., 2010; Gaigg et al., 2016), and the high prevalence of alexithymia within this population (Poquérusse et al., 2018).

Many studies in the review were underpowered, and did not report on elements such as treatment adherence. All studies used self-report measures to measure alexithymia, with the majority using the TAS-20. Whilst convenient for research purposes, the nature of alexithymia may mean those with high alexithymia levels may not be aware of their difficulties, and therefore there is the potential that difficulties may be over or under-reported when relying solely on self-report measures (Waller and Scheidt, 2004). It has therefore been recommended that multiple measures of alexithymia be used in research (Bagby et al., 2020; Waller and Scheidt, 2004), however only Byrne et al. (2016) used more than one alexithymia measure in the present review. Arguments for a multi-faceted measure of alexithymia have recently been proposed by Luminet and Nielson (2025).

Power is also an issue in moderation analyses in meta-analyses (Cuijpers et al., 2021), as it was herein. According to statistical modelling in a power analysis package in 'R', Cuijpers et al. (2021) found that significance of a moderation analysis is reliant upon differences between groups in terms of effect size and heterogeneity, as well as subgroup size. As the present meta-analysis contained subgroups with differing subgroup sizes (range: 3–15), appraising the moderation effect alone should not be taken as the only measure of subgroup difference (as this analysis was likely underpowered). Moderation analysis should not only take the overall effect into account, but also difference in subgroup effect size, whether confidence intervals overlap zero, and their within subgroup heterogeneity (Cuijpers et al., 2021).

In terms of the current review, a main limitation of the present review involved the categorisation of intervention type, which were grouped by their respective overarching paradigm, or method (e.g., psychoeducation and expressive writing). The CBT and third wave interventions and Psychodynamic subgroups maintained large heterogeneity, and this may be explained by the reality that interventions falling under these paradigms are not monolithic and vary widely with regard to theory and application. However, due to the limited numbers of each specific intervention included in each category, this was the most logical way to group interventions. As more research in the field is undertaken, it will be interesting to see more specific intervention types compared within the overarching therapeutic paradigms. Additionally, the spread of research in each category was uneven, making comparisons difficult. However, although only two studies were included in the meditation-based intervention category, combined sample size exceeded those in other categories with more included studies, such as psychodynamic interventions.

Furthermore, we were unable to assess comorbid psychological diagnosis as a moderator, as the majority of studies that used clinical samples recruited participants with multiple or varied diagnoses. This is likely to mirror clinical practice outside of research trials, where people present to therapy with different histories, needs and goals.

Recent papers have described the possible benefits of considering the efficacy of psychological intervention for alexithymia using scores designed to measure each facet of alexithymia (DIF, DDF and EOT) in favour of a total score (Luminet and Nielson, 2025; Schroeders et al., 2022). This is due to alexithymia profiles being multifaceted and variable where individuals will vary between which domain they have the most difficulty with and therefore may benefit from different types of

psychological intervention. Although we were only able to conduct a partial analysis of facets, these should be taken with caution as the TAS-20 subscales have issues with reliability and validity. Preece et al. (2020) used a factor analysis examining discriminant validity, finding that the DIF subscale in the TAS-20 appeared to overlap with factors on a measure of general distress. Similarly, Marchesi et al. (2014) found that the TAS-20, particularly the DIF and DDF sub-scales, were sensitive to assessing negative affect in participants with psychiatric diagnoses such as depression and anxiety in their study.

Studies measuring the reliability and validity of the subscales of the TAS-20 have yielded mixed results, particularly in relation to measuring EOT (Bagby et al., 2020), and therefore, measuring changes using the TAS-20's total alexithymia score may be more reliable than the use of only subscales. The TAS-20 has undergone reliability and validity testing repeatedly across the original and translated versions and has demonstrated adequate reliability and validity for the *total* alexithymia score for use in research (Bagby et al., 2020).

These limitations informed the design of the present meta-analysis, hence total alexithymia score was used as an outcome measure. Future research considering the different facets of alexithymia and their response to different psychological interventions using combined measures of alexithymia is warranted, to further understand how best to support people in reducing levels of alexithymia.

7.3. Implications and future directions

Interventions included in the systematic review and meta-analysis should be replicated using larger sample sizes and multiple alexithymia measures to improve on the quality of the evidence in this area. Given potential cultural differences in alexithymia, research into culturally-sensitive psychotherapies and psychotherapies developed outside of western psychology is essential. Additionally, as most studies reported mean alexithymia scores that indicated participants experienced moderate levels of alexithymia, more research is needed involving participants with higher levels of alexithymia to see if interventions remain effective for those scoring more highly. Studies explicitly including autistic participants are also warranted. Promisingly, protocols for interventions with autistic individuals are emerging, which reference alexithymia measures as part of the study (Huntjens et al., 2020; Parr et al., 2020). Additionally, further studies and realist evaluation with groups diagnosed with specific mental and physical health disorders will increase understanding about *which interventions* work best for *whom*. Future work should consider the different facets of alexithymia, how they interact with different expressions of diagnosed psychological difficulties, and include more robust measurements of alexithymia than relying on the TAS-20 alone.

8. Conclusion

It was hypothesised that interventions that were aimed at increasing emotional awareness, balancing interoceptive functioning and increasing interpersonal effectiveness would see larger effect sizes in reducing alexithymia scores compared with a control group. This was partially supported, as all intervention subgroups observed an effective reduction in alexithymia when compared with a control group. Integrative therapies observed large effect sizes, suggesting that integrating elements of the different therapeutic approaches may target a broader range of underlying mechanisms involved in alexithymia, and therefore have better outcomes. Studies employing Psychoeducation, Psychodynamic therapy and CBT and third wave interventions each observed reductions in alexithymia, however, heterogeneity remained substantial within each subgroup, and therefore could not be meaningfully discussed or compared to the remaining interventions. Strengths of the present review include the strict adherence to PRISMA guidelines (Page et al., 2021), and the incorporation of meta-analysis. The present study was able to find ways to combine the data in a way that reduced heterogeneity across some of the intervention subgroups, meaning some preliminary comparisons were possible.

CRediT authorship contribution statement

Amber Mazza: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Paige Davis:** Writing – review & editing, Supervision, Formal analysis, Conceptualization. **Lara Johnson:** Methodology, Investigation, Formal analysis, Data curation. **Fionnuala Larkin:** Writing – review & editing, Supervision, Conceptualization. **Scott N. Cole:** Writing – review & editing, Visualization, Supervision, Methodology, Formal analysis.

Funding

There was no funding source for this research.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors wish to thank Leeds Teaching Hospitals NHS Trust, UK, and York St John University for supporting this work, and Marius Boeltzig for technical assistance with help producing a Figure in R.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jad.2026.121167.

References

Aaron, R.V., Benson, T.L., Park, S., 2015. Investigating the role of alexithymia on the empathic deficits found in schizotypy and autism spectrum traits. Personal. Individ. Differ. 77, 215–220. https://doi.org/10.1016/j.paid.2014.12.032.

Adamson, J., Leppanen, J., Murin, M., Tchanturia, K., 2018. Effectiveness of emotional skills training for patients with anorexia nervosa with autistic symptoms in group and individual format. Eur. Eat. Disord. Rev. 26 (4), 367–375. https://doi.org/10.1002/erv.2594.

Bagby, R.M., Parker, J.D.A., Taylor, G.J., 1994. The twenty-item Toronto alexithymia scale—I. Item selection and cross-validation of the factor structure. J. Psychosom. Res. 38 (1), 23–32. https://doi.org/10.1016/0022-3999(94)90005-1.

Bagby, R.M., Taylor, G.J., Parker, J.D.A., Dickens, S.E., 2006. The development of the Toronto structured interview for alexithymia: item selection, factor structure, reliability and concurrent validity. Psychother. Psychosom. 75 (1), 25–39.

Bagby, R.M., Parker, J.D., Taylor, G.J., 2020. Twenty-five years with the 20-item Toronto alexithymia scale. J. Psychosom. Res. 131. https://doi.org/10.1016/j.jpsychores.2020.109940.

Beresnevaite, M., 2000. Exploring the benefits of group psychotherapy in reducing alexithymia in coronary heart disease patients: a preliminary study. Psychother. Psychosom. 69 (3), 117–122.

Berthoz, S., Consoli, S., Perez-Diaz, F., Jouvent, R., 1999. Alexithymia and anxiety: compounded relationships? A psychometric study. European Psychiatry: The Journal of the Association of European Psychiatrists 14, 372–378. https://doi.org/10.1016/S0924-9338(99)00233-3.

Bibby, P.A., 2016. Loss-chasing, alexithymia, and impulsivity in a gambling task: alexithymia as a precursor to loss-chasing behavior when gambling. Front. Psychol. 7. https://doi.org/10.3389/fpsyg.2016.00003.

Bird, G., Cook, R., 2013. Mixed emotions: the contribution of alexithymia to the emotional symptoms of autism. Transl. Psychiatry 3 (7), e285. https://doi.org/10.1038/tp.2013.61.

Bird, G., Viding, E., 2014. The self to other model of empathy: providing a new framework for understanding empathy impairments in psychopathy, autism, and alexithymia. Neurosci. Biobehav. Rev. 47, 520–532.

Bird, G., Silani, G., Brindley, R., White, S., Frith, U., Singer, T., 2010. Empathic brain responses in insula are modulated by levels of alexithymia but not autism. Brain 133 (5), 1515–1525. https://doi.org/10.1093/brain/awq060.

Borenstein, M., Hedges, L.V., Higgins, J.P.T., Rothstein, H.R., 2009. Introduction to Meta-analysis. John Wiley & Sons, Ltd. https://doi.org/10.1002/9780470743386.

Byrne, G., Bogue, J., Egan, R., Lonergan, E., 2016. "Identifying and describing emotions" measuring the effectiveness of a brief, alexithymia-specific, intervention for a sex offender population. Sex. Abus. 28 (7), 599–619.
Cameron, K., Ogrodniczuk, J., Hadjipavlou, G., 2014. Changes in alexithymia following psychological intervention: a review. Harv. Rev. Psychiatry 22 (3), 162–178.
Castonguay, L.G., Eubanks, C.F., Goldfried, M.R., Muran, J.C., Lutz, W., 2015. Research on psychotherapy integration: building on the past, looking to the future. Psychother. Res. 25 (3), 365–382. https://doi.org/10.1080/10503307.2015.1014010.
Cole, S., 2025, November 28. Alexithymia Metaanalysis Data1. Retrieved from. osf.io/xnhcp.
Cole, S.N., Smith, D.M., Ragan, K., Suurmond, R., Armitage, C.J., 2021. Synthesizing the effects of mental simulation on behavior change: systematic review and multilevel meta-analysis. Psychon. Bull. Rev. 28 (5), 1514–1537.
Cooper, D., Yap, K., Batalha, L., 2018. Mindfulness-based interventions and their effects on emotional clarity: a systematic review and meta-analysis. J. Affect. Disord. 235, 265–276. https://doi.org/10.1016/j.jad.2018.04.018.
Cooper, M., McLeod, J., 2007. A pluralistic framework for counselling and psychotherapy: implications for research. Couns. Psychother. Res. 7 (3), 135–143. https://doi.org/10.1080/14733140701566282.
Cuijpers, P., Griffin, J.W., Furukawa, T.A., 2021. The lack of statistical power of subgroup analyses in meta-analyses: a cautionary note. Epidemiol. Psychiatr. Sci. 30, e78. https://doi.org/10.1017/S2045796021000664.
da Silva, A.N., 2021. Developing emotional skills and the therapeutic Alliance in clients with alexithymia: intervention guidelines. Psychopathology 54 (6), 282–290. https://doi.org/10.1159/000519786.
de Groot, J.M., Rodin, G., Olmsted, M.P., 1995. Alexithymia, depression, and treatment outcome in bulimia nervosa. Compr. Psychiatry 36 (1), 53–60.
De Panfilis, C., Ossola, P., Tonna, M., Catania, L., Marchesi, C., 2015. Finding words for feelings: the relationship between personality disorders and alexithymia. Personal. Individ. Differ. 74, 285–291. https://doi.org/10.1016/j.paid.2014.10.050.
Egger, M., Smith, G.D., Schneider, M., Minder, C., 1997. Bias in meta-analysis detected by a simple, graphical test. Bmj 315 (7109), 629–634.
Farb, N., Daubenmier, J., Price, C.J., Gard, T., Kerr, C., Dunn, B.D., Klein, A.C., Paulus, M.P., Mehling, W.E., 2015. Interoception, contemplative practice, and health. Front. Psychol. 6. https://doi.org/10.3389/fpsyg.2015.00763.
Gaigg, S.B., Cornell, A.S., Bird, G., 2016. The psychophysiological mechanisms of alexithymia in autism spectrum disorder. Autism 22 (2), 227–231. https://doi.org/10.1177/1362361316667062.
Gawęda, Ł., Krężołek, M., 2018. Cognitive mechanisms of alexithymia in schizophrenia: investigating the role of basic neurocognitive functioning and cognitive biases. Psychiatry Research, in press. https://doi.org/10.1016/j.psychres.2018.12.023.
Gilbert, P., 2010. An introduction to compassion focused therapy in cognitive behavior therapy. Int. J. Cogn. Ther. 3 (2), 97–112.
Goerlich, K.S., 2018. The multifaceted nature of alexithymia – a neuroscientific perspective. Front. Psychol. 9. https://doi.org/10.3389/fpsyg.2018.01614.
Grabe, H.J., Frommer, J., Ankerhold, A., Ulrich, C., Groger, R., Franke, G.H., Barnow, S., Freyberger, H.J., Spitzer, C., 2008. Alexithymia and outcome in psychotherapy. Psychother. Psychosom. 77 (3), 189–194. https://doi.org/10.1159/000119739.
Gutiérrez Hermoso, L., Velasco Furlong, L., Sánchez-Román, S., Salas Costumero, L., 2020. The importance of alexithymia in post-surgery. Differences on body image and psychological adjustment in breast Cancer patients. Front. Psychol. 11. https://doi.org/10.3389/fpsyg.2020.604004.
Guzzo, G., Pace, U., Lo Cascio, V., Craparo, G., Schimmenti, A., 2014. Bullying victimization, post-traumatic symptoms, and the mediating role of alexithymia. Child Indic. Res. 7 (1), 141–153. https://doi.org/10.1007/s12187-013-9206-6.
Hallam, C., Simmonds-Buckley, M., Kellett, S., Greenhill, B., Jones, A., 2021. The acceptability, effectiveness, and durability of cognitive analytic therapy: systematic review and meta-analysis. Psychol. Psychother. Theory Res. Pract. 94 (S1), 8–35. https://doi.org/10.1111/papt.12286.
Halsband, U., Mueller, S., Hinterberger, T., Strickner, S., 2009. Plasticity changes in the brain in hypnosis and meditation. Contemp. Hypn. 26, 194–215. https://doi.org/10.1002/ch.386.
Harris, R., Hayes, S., 2019. ACT Made Simple: An Easy to Read Primer on Acceptance and Commitment Therapy. New harbinger, (2nd ed.). (Original work published 2009).
Hayes, S.C., Strosahl, K.D., Wilson, K.G., 1999. Acceptance and Commitment Therapy: An Experiential Approach to Behavior Change.
Haynes, R.B., Sackett, D.L., Richardson, W.S., Rosenberg, W., Langley, G.R., 1997. Evidence-based medicine: how to practice & teach EBM. Can. Med. Assoc. J. 157 (6), 788.
Helling, J., 2009. Non-declarative representational and regulatory Systems in Alexithymia. J. Trauma Dissociation 10 (4), 469–487. https://doi.org/10.1080/15299730903143675.
Hemming, L., Haddock, G., Shaw, J., Pratt, D., 2019. Alexithymia and its associations with depression, suicidality, and aggression: an overview of the literature. Front. Psychol. 10, 203. https://doi.org/10.3389/fpsyt.2019.00203.
Henrich, J., Heine, S.J., Norenzayan, A., 2010. Most people are not WEIRD. Nature 466 (7302), 29.
Higgins, J.P.T., Green, S., 2011. Cochrane Handbook for Systematic Reviews of Interventions, Version 5.1.0. www.handbook.cochrane.org.
Hogeveen, J., Grafman, J., 2021. Alexithymia. Handbook of clinical neurology 183, 47–62. https://doi.org/10.1016/B978-0-12-822290-4.00004-9.
Honkalampi, K., Saarinen, P., Hintikka, J., Virtanen, V., Viinamäki, H., 1999. Factors associated with alexithymia in patients suffering from depression. Psychother. Psychosom. 68, 270–275. https://doi.org/10.1159/000012343.
Honkalampi, K., Hintikka, J., Tanskanen, A., Lehtonen, J., Viinamäki, H., 2000. Depression is strongly associated with alexithymia in the general population. J. Psychosom. Res. 48 (1), 99–104. https://doi.org/10.1016/S0022-3999(99)00083-5.
Huntjens, A., van den Bosch, L.M.C.W., Sizoo, B., Kerkhof, A., Huibers, M.J.H., van der Gaag, M., 2020. The effect of dialectical behaviour therapy in autism spectrum patients with suicidality and/or self-destructive behaviour (DIASS): study protocol for a multicentre randomised controlled trial. BMC Psychiatry 20(1), Article 127. https://doi.org/10.1186/s12888-020-02531-1.
Jiménez-Orenga, N., Miguel, C., González-Robles, A., Fernández-Álvarez, J., Grimaldos, J., Bretón-López, J., Botella, C., Cuijpers, P., García-Palacios, A., Papola, D., Quero, S., Riper, H., Díaz-García, A., 2025. Transdiagnostic psychological interventions for emotional disorders: a comprehensive meta-analysis. J. Affect. Disord. 119537. https://doi.org/10.1016/j.jad.2025.119537. Advance online publication.
Kaufman, J.A., Jensen, J.A., 2018. Meditative training improves undergraduate executive functioning. J. Coll. Stud. Psychother. 32 (2), 163–179.
Kazdin, A.E., 2009. Understanding how and why psychotherapy leads to change. Psychother. Res. 19 (4–5), 418–428. https://doi.org/10.1080/10503300802448899.
Keefer, K.V., Taylor, G.J., Parker, J.D., Bagby, R.M., 2019. Taxometric analysis of the Toronto structured interview for alexithymia: further evidence that alexithymia is a dimensional construct. Assessment 26 (3), 364–374. https://doi.org/10.1177/1073191117769822.
Kinnaird, E., Stewart, C., Tchanturia, K., 2019. Investigating alexithymia in autism: a systematic review and meta-analysis. Eur. Psychiatry 55, 80–89. https://doi.org/10.1016/j.eurpsy.2018.09.004.
Kirschman, K.J.B., Johnson, R.J., Bender, J.A., Roberts, M.C., 2009. Positive Psychology for Children and Adolescents: Development, Prevention, and Promotion.
Kmet, L.M., Cook, L.S., Lee, R.C., 2004. Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields.
Krystal, H., 1979. Alexithymia and psychotherapy. Am. J. Psychother. 33 (1), 17–31.
Larkin, F., Ralston, B., Dinsdale, S.J., Kimura, S., Hayiou-Thomas, M.E., 2022. Alexithymia and intolerance of uncertainty predict somatic symptoms in autistic and non-autistic adults. Autism: The International Journal of Research and Practice 13623613221109717. https://doi.org/10.1177/13623613221109717.
Lee, K.S., Murphy, J., Catmur, C., Bird, G., Hobson, H., 2022. Furthering the language hypothesis of alexithymia: an integrated review and meta-analysis. Neurosci. Biobehav. Rev. 141, 104864. https://doi.org/10.1016/j.neubiorev.2022.104864.
Leichsenring, F., Abbass, A., Hilsenroth, M.J., Luyten, P., Munder, T., Rabung, S., Steinert, C., 2018a. "Gold Standards," Plurality and Monocultures: The Need for Diversity in Psychotherapy. Frontiers in Psychiatry 9. https://www.frontiersin.org/article/10.3389/fpsyt.2018.00159.
Leichsenring, F., Steinert, C., Crits-Christoph, P., 2018b. On mechanisms of change in psychodynamic therapy. Z. Psychosom. Med. Psychother. 64 (1), 16–22.
Li, S., Zhang, B., Guo, Y., Zhang, J., 2015. The association between alexithymia as assessed by the 20-item Toronto alexithymia scale and depression: a meta-analysis. Psychiatry Res. 227 (1), 1–9. https://doi.org/10.1016/j.psychres.2015.02.006.
Linehan, M.M., 1993. Skills Training Manual for Treating Borderline Personality Disorder. Guilford press.
Liu, Z., He, S., Hou, C., 2025. The effect of alexithymia on depression: evidence from meta-analysis. Front. Psychol. 16, 1465286.
Luminet, O., Nielson, K.A., 2025. Alexithymia: toward an experimental, processual affective science with effective interventions. Annu. Rev. Psychol. 76 (1), 741–769. https://doi.org/10.1146/annurev-psych-021424-030718.
Maniaci, G., Picone, F., van Holst, R.J., Bolloni, C., Scardina, S., Cannizzaro, C., 2017. Alterations in the emotional regulation process in gambling addiction: the role of anger and alexithymia. J. Gambl. Stud. 33 (2), 633–647.
Marchesi, C., Ossola, P., Tonna, M., De Panfilis, C., 2014. The TAS-20 more likely measures negative affects rather than alexithymia itself in patients with major depression, panic disorder, eating disorders and substance use disorders. Compr. Psychiatry 55 (4), 972–978. https://doi.org/10.1016/j.comppsych.2013.12.008.
McGillivray, L., Becerra, R., Harms, C., 2017. Prevalence and demographic correlates of alexithymia: a comparison between Australian psychiatric and community samples. J. Clin. Psychol. 73 (1), 76–87.
Messina, A., Beadle, J.N., Paradiso, S., 2014. Towards a classification of alexithymia: primary, secondary and organic. Journal of psychopathology 20, 38–49.
Murphy, J., Brewer, R., Catmur, C., Bird, G., 2017. Interoception and psychopathology: a developmental neuroscience perspective. Dev. Cogn. Neurosci. 23, 45–56.
Ng, C.S., Chan, V.C., 2020. Prevalence and associated factors of alexithymia among Chinese adolescents in Hong Kong. Psychiatry Res. 290, 113126.
Norman, H., Marzano, L., Coulson, M., Oskis, A., 2019. Effects of mindfulness-based interventions on alexithymia: a systematic review. Evid. Based Ment. Health 22 (1), 36–43. https://doi.org/10.1136/ebmental-2018-300029.
Nowakowski, M.E., McFarlane, T., Cassin, S., 2013. Alexithymia and eating disorders: a critical review of the literature. J. Eat. Disord. 1 (1), 21. https://doi.org/10.1186/2050-2974-1-21.
Ogrodniczuk, J., Kealy, D., Hadjipavlou, G., Cameron, K., 2018. Therapeutic issues. In: Luminet, O., Bagby, M., Taylor, G. (Eds.), Alexithymia Advances in Research, Theory, and Clinical Practice, 1st ed. Cambridge University Press, Cambridge, p. 199. https://doi.org/10.1017/9781108241595.014 [online].
Ogrodniczuk, J.S., Piper, W.E., Joyce, A.S., 2005. The negative effect of alexithymia on the outcome of group therapy for complicated grief: what role might the therapist play? Compr. Psychiatry 46 (3), 206–213. https://doi.org/10.1016/j.comppsych.2004.08.005.

Ogrodniczuk, J.S., Piper, W.E., Joyce, A.S., 2011. Effect of alexithymia on the process and outcome of psychotherapy: a programmatic review. Psychiatry Res. 190 (1), 43–48. https://doi.org/10.1016/j.psychres.2010.04.026.
Ouzzani, M., Hammady, H., Fedorowicz, Z., Elmagarmid, A., 2016. Rayyan—a web and mobile app for systematic reviews. Syst. Rev. 5 (1). https://doi.org/10.1186/s13643-016-0384-4.
Page, M.J., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D., Shamseer, L., Tetzlaff, J.M., Akl, E.A., Brennan, S.E., 2021. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. Bmj 372.
Parker, J.D., Keefer, K.V., Taylor, G.J., Bagby, R.M., 2008. Latent structure of the alexithymia construct: a taxometric investigation. Psychol. Assess. 20 (4), 385.
Parr, J.R., Brice, S., Welsh, P., Ingham, B., Le Couteur, A., Evans, G., Monaco, A., Freeston, M., Rodgers, J., 2020. Treating anxiety in autistic adults: study protocol for the personalised anxiety treatment-autism (PAT-A©) pilot randomised controlled feasibility trial. Trials 21 (1), 265. https://doi.org/10.1186/s13063-020-4161-2.
Pavord, E., Burton, M., 2014. Interventions with children, young people and families. In: Burton, M., Pavord, E., Williams, B. (Eds.), An Introduction to Child and Adolescent Mental Health, 1st ed. Sage publications ltd, London, p. 157 [online]. Available at: https://app.talis.com/yorksj/player#/modules/5f48bdb152703118d296f56f/resources/5f48c0e952703118d296f594#page-163>.
Peeters, N., van Passel, B., Krans, J., 2021. The effectiveness of schema therapy for patients with anxiety disorders, OCD, or PTSD: a systematic review and research agenda. Br. J. Clin. Psychol. 61 (3), 579–597. https://doi.org/10.1111/bjc.12324.
Philipp, R., Kriston, L., Lanio, J., Kühne, F., Härter, M., Moritz, S., Meister, R., 2018. Effectiveness of metacognitive interventions for mental disorders in adults—a systematic review and meta-analysis (METACOG). Clin. Psychol. Psychother. 26 (2), 227–240. https://doi.org/10.1002/cpp.2345.
Pinna, F., Manchia, M., Paribello, P., Carpiniello, B., 2020. The impact of alexithymia on treatment response in psychiatric disorders: a systematic review. Front. Psychol. 0. https://doi.org/10.3389/fpsyt.2020.00311.
Popolo, R., MacBeth, A., Canfora, F., Rebecchi, D., Toselli, C., Salvatore, G., Dimaggio, G., 2019. Metacognitive interpersonal therapy in group (MIT-G) for young adults with personality disorders: a pilot randomized controlled trial. Psychol. Psychother. Theory Res. Pract. 92 (3), 342–358.
Poquérusse, J., Pastore, L., Dellantonio, S., Esposito, G., 2018. Alexithymia and autism Spectrum disorder: a complex relationship. Front. Psychol. 9, 1196. https://doi.org/10.3389/fpsyg.2018.01196.
Porcelli, P., Tulipani, C., Di Micco, C., Spedicato, M.R., Maiello, E., 2011. Temporal stability of alexithymia in cancer patients following a psychological intervention. J. Clin. Psychol. 67 (12), 1177–1187.
Preece, D., Becerra, R., Boyes, M., Northcott, C., McGillivray, L., Hasking, P., 2020. Do self-report measures of alexithymia measure alexithymia or general psychological distress? A factor analytic examination across five samples. Personal. Individ. Differ. 155. https://doi.org/10.1016/j.paid.2019.109721.
Preece, D.A., Gross, J.J., 2023. Conceptualizing alexithymia. Personal. Individ. Differ. 215, 1–6. https://doi.org/10.1016/j.paid.2023.112375.
Preece, D.A., Mehta, A., Petrova, K., Sikka, P., Pemberton, E., Gross, J.J., 2024. Alexithymia profiles and depression, anxiety, and stress. J. Affect. Disord. 357, 116–125. https://doi.org/10.1016/j.jad.2024.02.071.
Price, C., 2005. Body-oriented therapy in recovery from child sexual abuse: an efficacy study. Altern. Ther. Health Med. 11 (5), 46.
Putica, A., Van Dam, N.T., Steward, T., Agathos, J., Felmingham, K., O'Donnell, M., 2021. Alexithymia in post-traumatic stress disorder is not just emotion numbing: systematic review of neural evidence and clinical implications. J. Affect. Disord. 278, 519–527. https://doi.org/10.1016/j.jad.2020.09.100.
Rogers, C., Fuchs, F., 2021. Client-Centered Therapy (70th Anniversary Edition.). Constable (Original work published 1951).
Ryder, A.G., Sunohara, M., Dere, J., Chentsova-Dutton, Y.E., 2018. The Cultural Shaping of Alexithymia.
Ryle, A., 1985. Cognitive theory, object relations and the self. Br. J. Med. Psychol. 58 (1), 1–7.
Schroeders, U., Kubera, F., Gnambs, T., 2022. The structure of the Toronto alexithymia scale (TAS-20): a Meta-analytic confirmatory factor analysis. Assessment 29 (8), 1806–1823. https://doi.org/10.1177/10731911211033894.
Shalev, I., 2019. Motivated cue integration in alexithymia: improving interoception and emotion information processing by awareness-of-sensation techniques. Front. Psychol. 10, 329.
Shibata, M., Ninomiya, T., Jensen, M.P., Anno, K., Yonemoto, K., Makino, S., Iwaki, R., Yamashiro, K., Yoshida, T., Imada, Y., Kubo, C., Kiyohara, Y., Sudo, N., Hosoi, M., 2014. Alexithymia is associated with greater risk of chronic pain and negative affect and with lower life satisfaction in a general population: the Hisayama study. PLoS One 9 (3), e90984. https://doi.org/10.1371/journal.pone.0090984.
Sifneos, P.E., 1973. The prevalence of 'Alexithymic' characteristics in psychosomatic patients. Psychother. Psychosom. 22 (2), 255–262. https://doi.org/10.1159/000286529.
Sterne, J.A., Hernán, M.A., Reeves, B.C., Savović, J., Berkman, N.D., Viswanathan, M., Henry, D., Altman, D.G., Ansari, M.T., Burton, I., Carpenter, J.R., Chan, A.W., Churchill, R., Deeks, J.J., Hróbjartsson, A., Kirkham, J., Jüni, P., Loke, Y.K., Pigott, T.D., Higgins, J.P., 2016. ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. bmj 355.
Sterne, J.A., Savović, J., Page, M.J., Elbers, R.G., Blencowe, N.S., Boutron, I., Cates, C.J., Cheng, H.-Y., Corbett, M.S., Eldridge, S.M., Hernán, M.A., Hopewell, S., Hróbjartsson, A., Junqueira, D.R., Jüni, P., Kirkham, J.J., Lasserson, T., Li, T., McAleenan, A., Higgins, J.P., 2019. RoB 2: a revised tool for assessing risk of bias in randomised trials. bmj 366.
Stingl, M., Hanewald, B., Kruse, J., Sack, M., 2020. Positive Side Effects in Trauma-Focusing PTSD Treatment: Reduction of Attendant Symptoms and Enhancement of Affective and Structural Regulation. Theory, Research, Practice, and Policy, Psychological Trauma.
Suurmond, R., van Rhee, H., Hak, T., 2017. Introduction, comparison, and validation of Meta-essentials: a free and simple tool for meta-analysis. Res. Synth. Methods 8, 537–553. https://doi.org/10.1002/jrsm.1260.
Taylor, G.J., Ryan, D., Bagby, M., 1985. Toward the development of a new self-report alexithymia scale. Psychother. Psychosom. 44 (4), 191–199.
Taylor, G.J., Bagby, R.M., Parker, J.D.A., 1997. Disorders of affect regulation: alexithymia in medical and psychiatric illness. Cambridge University Press. https://doi.org/10.1017/CBO9780511526831.
Taylor, G.J., Porcelli, P., Bagby, R.M., 2024. Alexithymia: A Defense of the Original Conceptualization of the Construct and a Critique of the Attention-Appraisal Model. Clin. Neuropsychiatry 21 (5), 329–357. https://doi.org/10.36131/cnfioritieditore20240501.
The jamovi project, 2024. *jamovi* (Version 2.5) [Computer Software]. Retrieved from. https://www.jamovi.org.
Tsubaki, K., Shimizu, E., 2024. Psychological treatments for alexithymia: a systematic review. Behav. Sci. 14 (12), 1173. https://doi.org/10.3390/bs14121173.
Tulipani, C., Morelli, F., Spedicato, M.R., Maiello, E., Todarello, O., Porcelli, P., 2010. Alexithymia and cancer pain: the effect of psychological intervention. Psychother. Psychosom. 79 (3), 156–163.
Vanheule, S., Desmet, M., Meganck, R., Bogaerts, S., 2007. Alexithymia and interpersonal problems. J. Clin. Psychol. 63 (1), 109–117. https://doi.org/10.1002/jclp.20324.
Vanheule, S., Desmet, M., Vanheule, S., V, J., Verhaeghe, P., & Desmet, M., 2010. Interpersonal Problems in Alexithymia: A Study in Three Primary Care Groups. The Ory, Research and Practice, Psychology and Psychotherapy, pp. 351–362.
Viding, C.G., Osika, W., Theorell, T., Kowalski, J., Hallqvist, J., Horwitz, E.B., 2015. "The culture palette"-a randomized intervention study for women with burnout symptoms in Sweden. British Journal of Medical Practitioners 8 (2), 5–12.
Vorst, H.C.M., Bermond, B., 2001. Validity and reliability of the Bermond–Vorst Alexithymia Questionnaire. Personal. Individ. Differ. 30 (3), 413–434. https://doi.org/10.1016/S0191-8869(00)00033-7.
Wakefield, J.C., Baer, J.C., Conrad, J.A., 2020. Levels of meaning and the need for psychotherapy integration. Clin. Soc. Work. J. 48 (3), 236–256. https://doi.org/10.1007/s10615-020-00769-6.
Waller, E., Scheidt, C.E., 2004. Somatoform disorders as disorders of affect regulation. J. Psychosom. Res. 57 (3), 239–247. https://doi.org/10.1016/S0022-3999(03)00613-5.
Wastell, C.A., Cairns, D., Haywood, H., 2009. Empathy training, sex offenders and re-offending. J. Sex. Aggress. 15 (2), 149–159.
Westwood, H., Kerr-Gaffney, J., Stahl, D., Tchanturia, K., 2017. Alexithymia in eating disorders: systematic review and meta-analyses of studies using the Toronto alexithymia scale. J. Psychosom. Res. 99, 66–81.
Williams, C., Wood, R.L., 2010. Alexithymia and emotional empathy following traumatic brain injury. J. Clin. Exp. Neuropsychol. 32 (3), 259–267. https://doi.org/10.1080/13803390902976940.
Williams, Z.J., Gotham, K.O., 2021. Improving the measurement of alexithymia in autistic adults: a psychometric investigation of the 20-item Toronto alexithymia scale and generation of a general alexithymia factor score using item response theory. Mol. Autism. 12 (1), 56. https://doi.org/10.1186/s13229-021-00463-5.
Wilson, D.B., 2023. Practical meta-analysis effect size calculator (Version 2023.11.27).
Wong, S., Bond, M.H., Rodriguez Mosquera, P.M., 2008. The influence of cultural value orientations on self-reported emotional expression across cultures. J. Cross-Cult. Psychol. 39 (2), 224–229. https://doi.org/10.1177/0022022107313866.
Yehuda, R., Steiner, A., Kahana, B., Binder-Brynes, K., Southwick, S.M., Zemelman, S., Giller, E.L., 1997. Alexithymia in holocaust survivors with and without PTSD. J. Trauma. Stress. 10 (1), 93–100. https://doi.org/10.1002/jts.2490100108.
Yi, Y., Huang, Y., Jiang, R., Chen, Q., Yang, M., Li, H., Wu, F., 2023. The percentage and clinical correlates of alexithymia in stable patients with schizophrenia. Eur. Arch. Psychiatry Clin. Neurosci. 273 (3), 679–686.
Zilcha-Mano, S., 2021. Toward personalized psychotherapy: the importance of the trait-like/state-like distinction for understanding therapeutic change. Am. Psychol. 76 (3), 516.