

Early maladaptive schemas, emotion regulation difficulties and alexithymia: A systematic review and meta-analysis

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Abstract

Background: Emotion regulation is an integral part of the schema therapy model. The aim of this systematic review and meta-analysis was to synthesize the evidence on the associations between early maladaptive schemas (EMSs), difficulties with emotion regulation and alexithymia.

Method: PsycINFO, PubMed and CINAHL Complete databases were searched on 28 May 2022 and 3 February 2023 in compliance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses. Included studies were in English, in peer-reviewed journals and reported on the association between one or more of the 18 EMSs or five schema domains and emotion regulation difficulties or alexithymia. Methodological quality was assessed using the Appraisal Tool for Cross-Sectional Studies. Meta-analyses were conducted to examine difficulties with emotion regulation and alexithymia as correlates of each EMS and domain.

Results: A total of 19 studies published between 2008 and 2022 were included (Pooled $N = 5957$). Difficulties with emotion regulation were positively correlated with all 18 EMSs (range: entitlement $r(7) = .28$, 95% CI [.13, .42] to negativity pessimism $r(5) = .53$, 95% CI [.23, .74]) and schema domains (range: impaired limits $r(5) = .34$, 95% CI [.08, .56] to disconnection rejection $r(5) = .44$, 95% CI [.33, .73]). Alexithymia was positively correlated with the other-directedness domain ($r(2) = .40$, 95% CI [.09, .64]) and 16 of the 18 EMSs (range: unrelenting standards $r(5) = .21$, 95% CI [.12, .28] to emotional inhibition $r(5) = .50$, 95% CI [.34, .63]).

Conclusions: The findings suggested that almost all 18 EMSs are implicated in emotion regulation difficulties and alexithymia, particularly those relating to unmet needs for attachment and autonomy.

KEYWORDS

early maladaptive schemas; emotion regulation, alexithymia; meta-analysis; schema domains; systematic review

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1 | INTRODUCTION

The capacity to recognize, accept and modulate emotions is fundamental to mental well-being (Chervonsky & Hunt, 2019; Hu et al., 2014; Williams et al., 2018). Meta-analysis findings have implicated difficulties with emotion regulation in almost all forms of psychopathology (Kraiss et al., 2020; Prefit et al., 2019), including depression (Li et al., 2015; Visted et al., 2018), substance use (Honkalampi et al., 2022; Weiss et al., 2022) and post-traumatic stress disorder (Frewen et al., 2008; Seligowski et al., 2015). Emotion regulation has thus been identified as a key transdiagnostic mechanism in psychotherapy (Hofmann & Hayes, 2019; Lane et al., 2022; Sloan et al., 2017). Although early models of cognitive therapy traditionally conceptualized emotion as a symptom or byproduct of negative cognitions (Samoilov & Goldfried, 2000), there is increasing recognition of the need to directly address affective experience and emotion regulation (Leahy, 2020; Samoilov & Goldfried, 2000; Stevens, 2019). Several contemporary third-wave therapies and integrative approaches emphasize emotional arousal and regulation as a primary therapeutic focus (Cludius et al., 2020; Iwakabe et al., 2023; Leahy, 2020; Samoilov & Goldfried, 2000; Sloan et al., 2017). One such approach is schema therapy, a treatment originally developed by Jeffrey Young (Young, 1999; Young et al., 2003) for clients who did not benefit from traditional cognitive therapy (Beck, 1964, 1991, 1993).

Schema therapy addresses mental health problems by targeting early maladaptive schemas (EMSs; see Table 1 for a list of the 18 EMSs organized by domain; Young et al., 2003). EMSs are dysfunctional mental representations of oneself and one's relationships with others that encompass cognitive (e.g., 'I am unlovable') and affective (e.g., sadness) components. EMSs are theorized to form in infancy and childhood when emotional needs critical to adaptive development are not adequately met (May et al., 2022; Pilkington et al., 2021; Young et al., 2003). According to Young et al. (2003), there are 18 EMSs organized into five higher-order domains (see Table 1). Although Bach et al. (2018) more recently suggested that the EMSs are best organized into four domains, we focus here on the original five domains. This is because investigations into the higher order structure of the YSQ have provided mixed support for four factors (Thimm, 2022), and the four domains proposed by Bach et al. (2018) were not examined by any of the studies included in the current review.

The first domain is termed *disconnection and rejection* and encompasses EMSs that centre around unmet needs for safety, belonging and emotional nurturance. As presented in Table 1, the disconnection and rejection domain includes five EMSs—abandonment/instability, mistrust/abuse, emotional deprivation, defectiveness/shame and social isolation/alienation. People who endorse schemas in this domain believe that they will be abandoned, neglected, abused and experience social rejection.

The second domain is impaired autonomy and performance and includes EMSs related to unmet needs for cultivating a sense of agency, identity and capability to effectively navigate and cope with life. Table 1 outlines the four EMS that comprise this domain—dependence/incompetence, vulnerability to harm/illness, enmeshment/underdeveloped self and failure. People who endorse the schemas within this domain

Key Practitioner Message

- An integral part of schema therapy is helping clients to access, accept and tolerate affect.
- Using a systematic approach and meta-analyses, this review identified that emotion regulation difficulties and alexithymia are strongly related to EMSs.
- The findings suggest that emotion regulation problems and alexithymia are prominent in individuals who hold disproportionate expectations that their needs for safety, predictability, acceptance and secure attachment will not be met.
- A pessimistic orientation, encompassing a perception that the world and what happens in the world is uncontrollable, and inevitably bad, plays an important role in difficulties regulating affective experience.

hold views that one's self lacks competence, ability and agency, that it is appropriate to maintain close proximity to others, and harbour a pervasive fear that they will be the victim of some medical, emotional, or external catastrophe.

The third schema domain is impaired limits, which includes two EMSs related to the unmet need for having realistic limits set regarding expectations and behaviour as well as self-control. These EMSs are entitlement/grandiosity and insufficient self-control/self-discipline (see Table 1). People who endorse these schemas experience difficulties with impulse control and maintain an excessively positive (grandiose) view of the self.

The fourth schema domain is other-directedness. This includes schemas that centre on the unmet need for having the freedom to express needs and emotions. As shown in Table 1, this domain comprises three EMSs: subjugation, self-sacrifice, approval-seeking/recognition-seeking. People that endorse schemas within this domain put the opinions and wishes of others over those of their own and tend to pursue the approval and esteem of others.

The fifth schema domain is over-vigilance and inhibition and encompasses schemas that focus on the unmet need for spontaneity and opportunities for play. As presented in Table 1, there are four EMSs in this domain—negativity pessimism, emotional inhibition, unrelenting standards/hyper-criticalness and punitiveness. People who endorse schemas in this domain tend to maintain a negative orientation towards life, seek to control many aspects of their life, and be excessively focused on morals and standards.

In adulthood, EMS activation is characterized by intense emotional arousal (Edwards & Wupperman, 2020), and EMSs are prominent in individuals with mental disorders characterized by emotion dysregulation, such as depression (Bishop et al., 2021) and borderline personality disorder (Barazandeh et al., 2016). The current review reports on the first meta-analysis of the empirical literature on the associations between EMSs and difficulties with emotion regulation and alexithymia.

TABLE 1 Core emotional needs, schema domains and EMS.

Schema domain	Unmet emotional need	Domain definition	EMS	Representative items from the YSQ-S3
Disconnection/rejection	Safety, nurturance and secure attachment	Expectations that one's needs for safety and nurturance will not be consistently met	Emotional deprivation	I don't have people to give me warmth, holding, and affection.
			Abandonment	I find myself clinging to people I'm close to because I'm afraid they'll leave me.
			Defectiveness shame	I'm unworthy of the love, attention, and respect of others.
			Mistrust abuse	I am quite suspicious of other people's motives.
			Social isolation	I'm fundamentally different from other people.
Impaired autonomy and performance	Autonomy, competence and identity	Expectations that one will be unable to function independently, protect oneself or succeed in life	Failure	I'm incompetent when it comes to achievement.
			Dependence/incompetence	My judgment cannot be counted on in everyday situations.
			Vulnerability to harm	I worry that I'm developing a serious illness, even though nothing serious has been diagnosed by a doctor.
			Enmeshment/undeveloped self	I often feel I do not have a separate identity from my parent(s) or partner.
Impaired limits	Realistic limits and self-control	Difficulties with frustration tolerance, considering others or following social rules or conventions	Entitlement/grandiosity	I'm special and shouldn't have to accept many of the restrictions or limitations placed on other people.
			Insufficient self-control/self-discipline	I can't force myself to do things I don't enjoy, even when I know it's for my own good.
Other-directedness	Freedom to express needs and emotions	An excessive focus on the needs, wants and feelings of others, at the expense of one's own needs and feelings.	Subjugation	I feel as if I have no choice but to give in to other people's wishes, or else they will retaliate, get angry, or reject me in some way.
			Self-sacrifice	I am a good person because I think of others more than myself.
			Approval seeking/recognition seeking	Lots of praise and compliments make me feel like a worthwhile person.
Over-vigilance and inhibition	Spontaneity and play	Emphasis on meeting excessively rigid rules and expectations at the expense of self-expression, relaxation and joy	Negativity pessimism	Even when things seem to be going well, I feel that it is only temporary.
			Emotional inhibition	I find it embarrassing to express my feelings to others.
			Unrelenting standards/hyper-criticalness	I must be the best at most of what I do; I can't accept second best.
			Punitiveness	If I make a mistake, I deserve to be punished.

For the purposes of this review, difficulties with emotion regulation are defined in accordance with Gratz and Roemer's acceptance-based model as deficits in (a) awareness and understanding of emotions; (b) acceptance of emotions; (c) the ability to control impulsive behaviours; and (d) the ability to act in accordance with desired goals when experiencing negative emotions (Gratz & Roemer, 2004; Gratz & Tull, 2022). It is important to note that although constructs such as dissociation, mindfulness and general coping or defence mechanisms are related to emotion regulation, these constructs are nonetheless conceptually distinct. Therefore, these constructs were outside the remit of the current review. Dissociation refers to problems with integrating several domains of mental functioning and correlates only moderately with emotion regulation (Cavicchioli et al., 2021). Although mindfulness can involve awareness of one's emotions, it is a broader term that encompasses non-judgmental attention to various aspects of one's subjective experience, including thoughts, bodily sensations, and the surrounding environment (Guendelman et al., 2017). Coping styles and responses were also considered too general for inclusion in the current review, as they include broader strategies such as behavioural avoidance and general problem-solving skills. However, we did include the construct of alexithymia in our review. Alexithymia refers to chronic difficulties with identifying and describing feelings (Preece et al., 2022; Sifneos, 1973). Awareness and understanding of emotions are key aspects of emotion processing and requisite for adaptive affect regulation (Preece et al., 2023).

Given the affective component of EMSs, the schema therapy model emphasizes emotion regulation in several important ways. An integral part of schema therapy is helping clients to access, accept and tolerate affect; recognize and address unmet emotional needs; and reduce maladaptive coping responses to negative emotions (Dadomo et al., 2016; Farrell et al., 2014; Young et al., 2003). Schema therapy is differentiated from traditional cognitive behavior therapy by its emphasis on emotion-focused techniques (e.g., imagery) to access and challenge maladaptive mental representations and facilitate change at an emotional level. Addressing the affective content of EMSs is seen as requisite for profound, long-term change. Indeed, Young et al. (2003, p. 29) noted that 'emotions have primacy over cognitions in working with many schemas'. Notably, one of schema therapy's core processes, limited reparenting, involves the therapist seeking to satisfy the emotional needs of the client, within the appropriate limits of therapy (Dadomo et al., 2016; Young et al., 2003). The provision of a validating and empathic therapeutic relationship is thought to be internalized by the client and strengthen their capacity to self-soothe (Lane et al., 2022). Therefore, identifying the EMSs that are more strongly associated with emotion regulation difficulties and alexithymia can provide an important way forward, both for research and practice, by improving our understanding of the EMSs that are especially problematic in people's abilities to effectively regulate their emotions. This can then guide applied researchers and therapists as to the EMSs that should be targeted when employing limited reparenting, imagery and chair work to address clients' challenges in processing and regulating their emotions.

1.1 | The current review

The aim of the study was to systematically review and meta-analyse the evidence on the associations between EMSs and difficulties with emotion regulation and alexithymia. Despite the relevance of attending to and working with emotion in schema therapy, there exists no quantitative review of the literature on the relationships between EMSs, difficulties with emotion regulation and alexithymia. Given that inherent in the schema therapy model is the notion that an individual's perceptions of self and others are tied to affective experience, it is critical to examine the empirical evidence regarding these associations. Providing a synthesis of this evidence allows us to establish a general sense of the magnitude of these relationships and can strengthen our confidence in our assumptions of the schema therapy model and the use of intervention strategies focused on emotional expression and regulation.

2 | METHOD

We completed a systematic review and meta-analysis to examine the associations between EMSs with difficulties with emotion regulation and alexithymia. The review was conducted in compliance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Page et al., 2021). See Data S1 for the PRISMA checklist.

2.1 | Search strategy

Searches of the electronic databases PsycINFO (EBSCOhost), PubMed and Cumulative Index to Nursing and Allied Health Literature (CINAHL) Complete (EBSCOhost) were completed on 28 May 2022, using the search terms ('maladaptive schema*') AND ('emotion* OR *regulat* OR alexithym*'). The search terms could appear anywhere in the full text. Where possible, searches were limited to articles that were peer-reviewed and written in English. On 29 May 2022, we (1) manually searched the reference lists of the included studies (manual reference search); (2) used Scopus to identify articles that had cited the included studies (forward citation search); and (3) screened the studies included in a bibliometric analysis of the quantitative schema therapy literature (in progress). On 3 February 2023, the initial search was replicated with date limits applied to identify articles published since May 2022.

2.2 | Eligibility criteria

Studies eligible for inclusion were required to meet the following criteria: (a) reported original quantitative data; (b) published in a peer-reviewed journal; (c) assessed one or more of the 18 EMSs (as defined by Young et al.) or schema domains; and (d) assessed difficulties with emotion regulation or alexithymia. Participants could be any age.

Studies were excluded if (a) the article did not report original data (e.g., the article was a review paper, meta-analysis or discussion paper); (b) the article was not in English; (c) measures were administered following exposure to an intervention; (e) assessed schema modes (e.g., the Schema Mode Inventory—as such measures do not provide a direct assessment of EMSs); or (f) assessed dissociation, defence styles or general coping.

The first author used *Rayyan* (Ouzzani et al., 2016) to screen all the potential studies for inclusion based on the article title and abstract and, if necessary, the full text. The fourth author independently confirmed that all included studies were eligible for inclusion.

2.3 | Data extraction and synthesis

Independent data extraction was completed by the first and fourth authors using a standardized Microsoft Excel spreadsheet. Extracted data included descriptive information about the sample, details of the predictor and outcome variables and the associations between EMSs and schema domains and difficulties with emotion regulation. The first author collated the data extraction, and discrepancies were resolved through discussion. Several articles reported measuring EMSs and/or schema domains and difficulties in emotion regulation but did not report all of the relevant associations within their article. The authors were contacted via email and asked to provide the relevant statistics. Of the 25 authors contacted, 10 responded and provided the requested data, two responded and clarified that the requested data were unavailable and 13 did not respond with the requested data. This resulted in five studies being excluded.

2.4 | Meta-analysis procedures

The data were synthesized by tabulating the characteristics of the included studies. Separate meta-analyses were completed using *Meta-Essentials* (Suurmond et al., 2017) to investigate individual EMSs and schema domains as correlates of difficulties in emotion regulation and alexithymia. Statistical power for the meta-analyses was computed using the R package *metapower* via the web-based application (https://jason-griffin.shinyapps.io/shiny_metapower/; Griffin, 2021). This indicated that all meta-analyses were adequately powered (minimum 80% power; $p < 0.05$).

The correlation coefficient r was used as the summary effect size metric as it was the effect size reported by most studies. The magnitude of the pooled effect sizes was interpreted in accordance with McGrath and Meyer's (2006) guidance ($r > .37 = \text{large}$). As we anticipated considerable heterogeneity, all meta-analyses used the random-effects model, with the inverse variance weighting method applied, with an additive between-studies variance component based on the DerSimonian–Laird estimator (DerSimonian & Laird, 1986). The analyses used Fisher's r -to- z transformation (Fisher, 1921 in Suurmond et al., 2017). Certainty is indicated by the confidence intervals of the pooled effect sizes.

Heterogeneity was assessed using the I^2 statistic (0–40%: might not be important; 30–60%: may represent moderate heterogeneity; 50–90%: may represent substantial heterogeneity; 75–100%: considerable heterogeneity; Higgins et al., 2019). Subgroup analyses and publication bias tests were not completed as none of the meta-analyses included the minimum 10 associations required for these tests to be meaningful (Higgins et al., 2019).

Where studies reported on multiple measures of difficulties with emotion regulation, the subscale with the items that most closely aligned with our definition was included in the meta-analysis. Where studies reported on both the Toronto Alexithymia Scale (TAS) total score and TAS subscale scores, only the associations with the total scores were included in the meta-analyses.

2.5 | Quality assessment

The quality of the included studies was assessed using the Appraisal Tool for Cross-Sectional Studies (AXIS) (Downes et al., 2016). This tool comprises 20 criteria (see Data S1) relating to the introduction, methods, results, discussion, conflicts of interest and ethical approval (response scale: yes, no, do not know). The criteria were applied to each of the included articles to ascertain their methodological quality. The AXIS tool was selected as it is comprehensive and was developed using the Delphi consensus method to identify the key components needed to evaluate the quality of cross-sectional studies. The first and second authors independently completed the quality assessment ratings.

3 | RESULTS

In total, 19 studies met the eligibility criteria and were included in the review and 19 of these reported data that could be meta-analysed. The flow of studies through the screening and selection process is summarized in the PRISMA flow-diagram in Figure 1.

3.1 | Characteristics of included studies

The studies were published between 2008 and 2022, with more than 50% published in the past 2 years. Studies were conducted in Turkey ($k = 4$), the United States of America ($k = 3$), the United Kingdom ($k = 2$), Iran ($k = 2$), Australia ($k = 2$), Singapore ($k = 1$), Finland ($k = 1$), Germany ($k = 1$), Lebanon ($k = 1$), Portugal ($k = 1$) and South Korea ($k = 1$). The sample sizes ranged from 58 to 972 participants (Mdn $N = 254$; Pooled $N = 6,277$). All studies were cross-sectional and used self-report questionnaires ($k = 19$). Most studies recruited community or student samples ($k = 11$), six studies recruited clinical samples and two studies recruited clinical samples and healthy adults. Participants were primarily female: three studies recruited females only, 12 studies recruited samples comprising of more than 60% females and four studies recruited gender-balanced samples. Participants were mostly adults, with the youngest sample having a mean

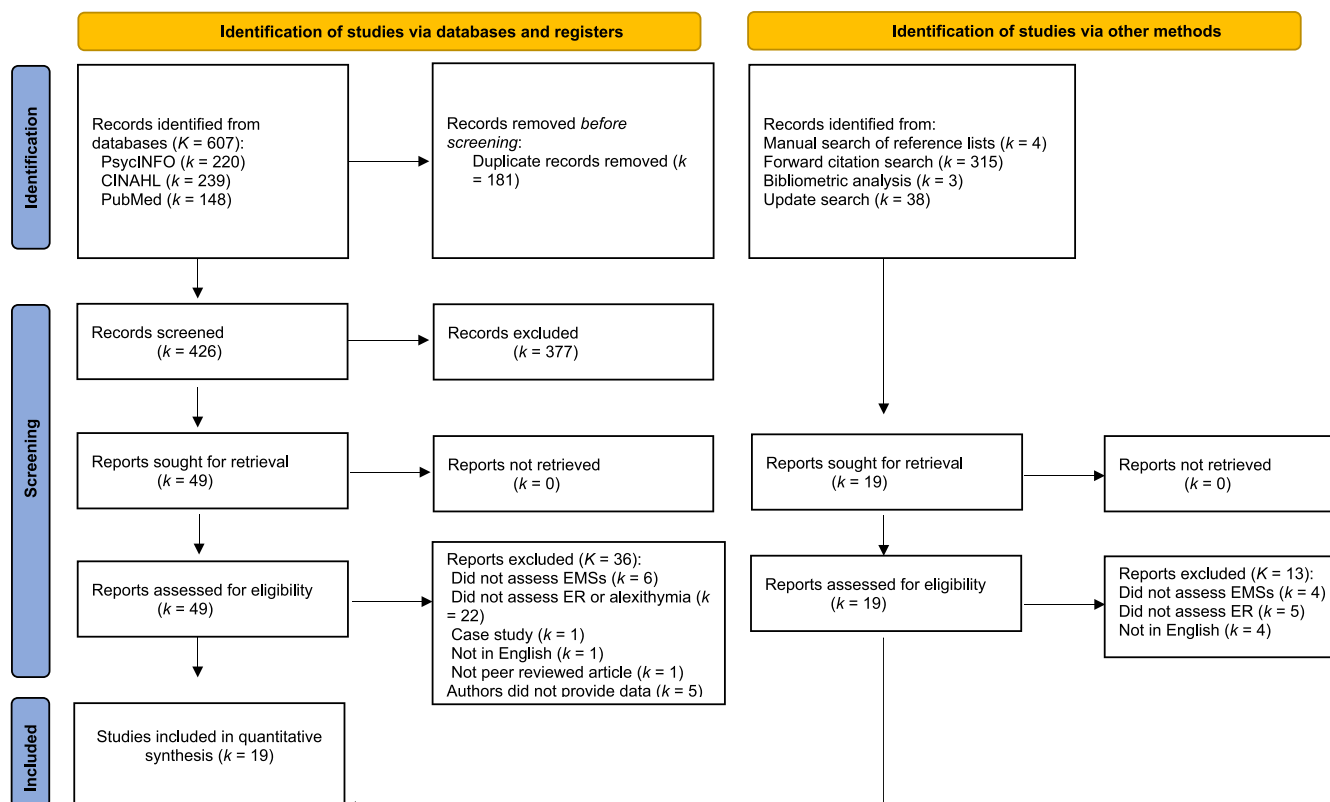


FIGURE 1 PRISMA flow-diagram.

age of $M = 15.72$ years ($SD = 0.99$). The remaining samples ranged in age from 18.7 ($SD = 1.50$) to 47.6 years ($SD = 10.48$).

All studies used versions of the YSQ to assess EMSs (Young & Brown, 2005). The 15 studies that examined difficulties in emotion regulation used the following measures: the Difficulties in Emotion Regulation Scale (DERS; $k = 7$; Gratz & Roemer, 2004), the Distress Tolerance Scale (DTS; $k = 2$; Simons & Gaher, 2005), the Beliefs about Emotion Scale (BES; $k = 1$; Rimes & Chalder, 2010), the Coping Strategies Inventory (CSI; Tobin et al., 1989) emotion-focused disengagement subscale ($k = 1$), the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) suppression subscale ($k = 1$), the Emotional Expressivity Scale (EES; $k = 1$; Kring et al., 1994), the Emotional Processing Difficulties Scale (EPDS; Faustino et al., 2022) self-interruption split and absence of meaning subscales ($k = 1$) and the Emotional Processing Scale (EPS-25; $k = 1$; Baker et al., 2010). A total of five studies examined alexithymia, and all used a version of the TAS (Bagby et al., 1994).

The characteristics of the included studies are provided in Table 2. Details of the effect sizes reported by each study are presented in Data S1 due to the volume of associations.

3.2 | Quality assessment

The studies included in this review were rated across the domains of the AXIS critical appraisal tool (see Data S1). Of the 19 included

studies, all but one clearly stated the aims. All studies used an appropriate research design to address their aims, used appropriate validated measures to assess EMSs and emotion regulation variables, adequately described the basic data, reported internally consistent results for all the analyses described in the methods and made it clear what was used to determine statistical significance and/or provided precision estimates. All but one study described the methods sufficiently to enable them to be repeated and presented results for all the analyses described in the methods. All authors' discussions and conclusions were justified by the results, and all acknowledged the study limitations. All but two studies indicated that ethical approval or consent of participants was attained.

However, only two studies justified their sample sizes, and none used a selection process that was likely to select a sample that was representative of the population under investigation, due to a reliance on convenience sampling. Of the 19 studies, seven did not clearly define their target/reference population clearly, and 14 did not take the sample frame from an appropriate population base so that it closely represented the target/reference population under investigation. For all but two studies, it was unclear whether the response rate raised concerns about non-response bias. Only one study took measures to address and categorize non-responders, and no studies described information about non-responders. Seven studies did not clarify whether there were any funding sources or conflicts of interest.

TABLE 2 Characteristics of included studies.

Author (year)	Country	N	% Female	Age in years, M (SD)	Sample description	Difficulties in ER measure	Alexithymia measure	EMs measure
Faustino and Vasco (2020)	Portugal	66	77%	46.40 (13.10)	Psychiatric patients at a hospital	EPDS		YSQ-S3
Feyzioglu et al. (2022)	Turkey	435	69%	34.47 (12.08)	Community		TAS-20	YSQ-S3
Hovrud et al. (2019)	USA	458	74%	19.26 (1.41)	University students	DTS		YSQ-S3
Gerges et al. (2022)	Lebanon	982	71%	21.97 (3.33)	Young adults in five Lebanese governates	DRS		YSQ-S3
Karimzadeh et al. (2021)	Iran	210	100%	47.60 (10.48)	Breast cancer patients	ERQ		YSQ-SF
Kaya-Demir and Çirakoğlu (2021)	Turkey	254	54%	42.73 (15.08)	Individuals bereaved within last 5 years	DERS		YSQ-S3
Ke and Barlas (2020)	Singapore	142	64%	23.18 (4.97)	University students	CSI		YSQ-S3
Lawson et al. (2008)	UK	70	100%	28.50 (8.66)	Women with eating disorders		TAS-20	YSQ-SF
Lee and Kim (2021)	South Korea	550	50%	21.90 (2.63)	University students	EES		YSQ-SF
Phillips et al. (2013)	Australia	IBS = 72; HC = 58	IBS = 78%; HC = 75%	IBS = 43.80 (16.50); HC = 38.80 (14.20)	Patients with irritable bowel syndrome and healthy controls	EPS-25	TAS-20	YSQ-S2
Nicol et al. (2022)	Australia	404	66%	18.70 (1.50)	University and secondary students	DRS		YSQ-S3
Pust et al. (2020)	Germany	571	77%	43.40 (10.90)	Individuals with multiple sclerosis		TAS-26	YSQ-S3
Rimes and Chalder (2010)	UK	CF = 111; HC = 71	CF = 76%; HC = 67%	CF = 38.80 (11.90); HC = 37.60 (11.70)	Patients with chronic fatigue and healthy adults	BES		YSQ
Saariaho et al. (2015)	Finland	271	53%	47.00 (9.30)	Outpatients with chronic pain		TAS-20	YSQ-S2
Sajadi et al. (2015)	Iran	300	50%	15.72 (0.99)	High school students	DERS		YSQ-SF
Şenkal Ertürk et al. (2018)	Turkey	291	70%	22.96 (5.62)	Community	DERS		YSQ-S3
Simons et al. (2018)	USA	364	72%	19.31 (1.47)	University students	DTS		YSQ-S3
Smyth et al. (2017)	USA	110	100%	23.94 (6.02)	University students	DERS		YSQ-S3
Yakin et al. (2019)	Turkey	296	60%	26.85 (7.07)	Community	DERS		YSQ-S3

Abbreviations: BES, Beliefs about Emotions Scale; CF, Chronic Fatigue; DERS, Difficulties in Emotion Regulation Scale; DES, Differential Emotions Scale; DTS, Distress Tolerance Scale; EES, Emotional Expressivity Subscale; EPDS, Emotional Processing Difficulties Scale; EPS-25, Emotional Processing Scale; ERQ, Emotion Regulation Questionnaire; HC, Healthy controls; IBS, irritable bowel syndrome patients; TAS, Toronto Alexithymia Scale; UK, United Kingdom; USA, United States of America.

3.3 | Difficulties with emotion regulation, schema domains and EMSs

Difficulties with emotion regulation were significantly positively associated with all schema domains with the magnitude of the pooled correlations ranging from moderate (impaired limits, $r[5] = .34$, 95% CI [.08, .56]) to large (disconnection rejection, $r[5] = .55$, 95% CI [.33, .72]; see Table 3). Three of the five pooled correlations exceeded .50—namely, disconnection rejection, impaired autonomy and over-vigilance and inhibition. Substantial heterogeneity was detected ($I^2 = 83\text{--}89\%$).

Difficulties with emotion regulation were positively correlated with all 18 EMSs. As shown in Table 3, the largest associations were found between difficulties with emotion regulation and negativity pessimism ($r[5] = .53$, 95% CI [.23, .74]) and defectiveness shame ($r[10] = .52$, 95% CI [.45, .58]). The smallest association was found between difficulties with emotion regulation and the entitlement schema ($r[7] = .28$, 95% CI [.13, .42]). Moderate to considerable heterogeneity was present in all analyses ($I^2 = 64\text{--}96\%$).

3.4 | Alexithymia, schema domains and EMSs

Meta-analyses of the associations between alexithymia and each of the schema domains indicated that only other-directedness domain score was positively correlated with alexithymia ($r[2] = .40$, 95% CI [.09, .64]). The confidence intervals around the pooled effect sizes of the remaining EMS domains contained zero, and there was substantial heterogeneity detected ($I^2 = 78\text{--}89\%$).

Positive correlations were found between alexithymia and 16 of the 18 EMSs (see Table 3). Emotional inhibition ($r[5] = .50$, 95% CI [.28, .56]) and negativity pessimism ($r[2] = .50$, 95% CI [.22, .71]) demonstrated the largest pooled effect sizes. As shown in Table 3, the smallest associations were found between alexithymia and the self-sacrifice and unrelenting standards schemas, followed by emotional deprivation, abandonment, mistrust abuse, social isolation, defectiveness shame, failure, dependence incompetence, vulnerability to harm, enmeshment, insufficient self-control, entitlement, subjugation and emotional inhibition. No associations were found with punitiveness or approval seeking. Moderate to considerable

TABLE 3 Meta-analyses examining early maladaptive schemas and difficulties with emotion regulation and alexithymia.

Schemas and domains	Difficulties with emotion regulation					Alexithymia				
	<i>k</i>	<i>N</i>	<i>r</i>	95% CI	<i>I</i> ²	<i>k</i>	<i>N</i>	<i>r</i>	95% CI	<i>I</i> ²
Disconnection rejection	5	1777	.55	.33, .72	85%	2	1006	.60	-.24, .92	81%
Emotional deprivation	10	2744	.34	.23, .45	89%	5	906	.43	.28, .56	56%
Abandonment	10	2938	.48	.36, .58	89%	5	906	.44	.28, .58	64%
Mistrust abuse	7	1980	.47	.34, .58	77%	4	471	.47	.27, .64	45%
Social isolation	9	2648	.44	.28, .57	92%	5	906	.41	.17, .61	83%
Defectiveness shame	10	3096	.52	.45, .58	59%	5	906	.44	.21, .62	73%
Impaired autonomy	5	1777	.51	.29, .68	82%	2	1006	.58	-.50, .95	89%
Failure	8	2234	.43	.28, .56	82%	5	906	.42	.29, .54	53%
Dependence incompetence	7	1980	.42	.26, .56	81%	4	471	.44	.29, .57	20%
Vulnerability to harm	9	2444	.46	.33, .57	88%	5	906	.48	.35, .59	42%
Enmeshment	8	2234	.35	.18, .50	89%	5	906	.32	.07, .54	89%
Impaired limits	5	1777	.34	.08, .56	96%	2	1006	.40	.09, .64	0%
Insufficient self-control	10	2902	.39	.26, .52	91%	4	471	.33	.04, .57	60%
Entitlement	7	1980	.28	.13, .42	91%	5	906	.30	.22, .37	0%
Other-directedness	5	1777	.46	.28, .61	89%	2	1006	.40	.09, .64	0%
Subjugation	7	1980	.49	.39, .58	64%	4	471	.41	.12, .64	64%
Self-sacrifice	10	2416	.33	.23, .42	84%	5	906	.27	.10, .42	63%
Approval seeking	5	1740	.43	.22, .59	89%	2	706	.34	-.34, .79	51%
Over-vigilance and inhibition	5	1777	.52	.32, .68	83%	2	1006	.44	-.52, .91	85%
Emotional inhibition	9	2962	.42	.31, .53	83%	5	906	.50	.34, .63	57%
Unrelenting standards	8	2234	.31	.21, .40	84%	5	906	.21	.12, .28	0%
Negativity pessimism	5	1740	.53	.23, .74	90%	2	706	.50	.22, .71	0%
Punitiveness	5	1740	.38	.15, .58	88%	2	706	.34	-.20, .73	25%

heterogeneity was present in all but three of the meta-analyses ($I^2 = 20\text{--}89\%$).

Given the small number of studies conducted at the domain level (especially in relation to alexithymia), we examined the proportion of EMS associations within each respective domain whose correlation were $\geq .37$ (i.e., large in magnitude; McGrath & Meyer, 2006) with difficulties regulating emotions and alexithymia. Overall, 75–80% of EMSs in the disconnection rejection and impaired autonomy domains showed large correlations, whereas a smaller proportion of correlations with EMSs in the other domains were large (66%).

4 | DISCUSSION

This article reports on the first meta-analysis of the literature on EMSs, difficulties regulating emotions, and alexithymia. The findings provide insights into the associations between EMSs and challenges with understanding, recognizing, accepting and modulating emotions (Gratz & Roemer, 2004). Separate meta-analyses were conducted to examine the extent to which EMSs are related to difficulties with emotion regulation and alexithymia. Both outcomes were included in the current review to provide a comprehensive understanding of the relevance of EMSs to the spectrum of emotion regulation problems, from general difficulties in modulating affective experiences, to more severe and pervasive difficulties with identifying and describing emotions, captured by alexithymia.

Overall, the meta-analytic findings provided evidence that greater difficulties in emotion regulation and alexithymia are generally associated with EMSs. Difficulties with emotion regulation were significantly positively correlated with all five EMS domains. The domain-level associations for alexithymia also evidenced large pooled associations for disconnection rejection and impaired autonomy. However, the only significant schema domain associated with alexithymia was other-directedness. It is important to note that the lack of significant associations across the other domains with alexithymia should be interpreted with caution as only two studies contributed to each of these domain-level effect size estimates.

The overall pattern of findings at the domain and individual schema level suggests that two broad clusters of schemas are especially implicated in difficulties regulating emotions and alexithymia. These relate to the EMSs that are theorized to develop when two core emotional needs are not met. The first is the need to experience nurturing and secure attachment relationships (which is theorized to align with schemas within the disconnection rejection domain) (Young et al., 2003). From an attachment theory perspective (Gillath et al., 2016; Mikulincer et al., 2003; Shaver & Mikulincer, 2014), experiencing relationships with attachment figures characterized by a lack of sensitivity, responsiveness, and insecurity is widely acknowledged to have implications for the way that people struggle to identify, describe and regulate their emotions. This is because attachment theory is considered a theory of interpersonal distress regulation (Mikulincer & Shaver, 2019; Shaver et al., 2016). That is, people turn to their attachment figures to seek comfort in times of

stress and strain and to help them develop effective ways to describe and manage their emotions. However, when individuals hold chronic mental representations of others as unreliable and untrusting, emotionally neglectful and view themselves as unloved by attachment figures as well as likely to be abandoned (EMSs situated in the disconnection and rejection domain), then they are unlikely to turn to others to assist in the regulation of distress, nor can they use attachment figures as a scaffold for describing and processing emotions. Indeed, those who endorse such schemas tend to have insecure attachment relationships with close others (Karantzas et al., 2023). Furthermore, from an attachment theory perspective, harbouring such negative views of attachment figures is likely to heighten attachment-related distress thereby further challenging individuals' abilities to effectively regulate their distress (Gillath et al., 2016; Mikulincer & Shaver, 2019).

The second is the need to function as an agentic, competent and independent individual that can succeed in life and cope with challenges and distress (which is theorized to align with schemas within the impaired autonomy domain) (Young et al., 2003). It is widely acknowledged across several psychological theories of needs and human development that harbouring a sense of competence and agency is critical to people's abilities to identify emotions and effectively deal with distress as well as regulate emotions (e.g., Dweck, 2017; Roth et al., 2019). Thus, the findings of our meta-analysis suggest that individuals who endorse schemas relating to being a failure, incompetent, unable to handle distress and vulnerable to harm are likely to struggle with modulating negative affect in an adaptive manner.

Beyond the schemas that feature within the domains of disconnection and rejection and impaired autonomy, the EMSs of negativity pessimism, subjugation and emotional inhibition demonstrated the largest associations with emotion regulation difficulties and alexithymia across the other three schema domains. Pessimism is characterized by rigid, chronic negative expectations about the future and perceptions of low control over what happens (Pavani & Colombo, 2023). Thus, when faced with a stressful situation, pessimistic individuals are unlikely to feel motivated to engage in goal-directed behaviour as they do not expect their personal efforts to effect change on the situation (Ouellet et al., 2019; Pavani & Colombo, 2023). Furthermore, these individuals are likely to hold a negative orientation not only to the situation but to their emotions. Specifically, individuals with these schemas are likely to anticipate negative affect and doubt their capacity to change their affective experience (Ouellet et al., 2019). Indeed, as noted by Ouellet et al. (2019), several items on the DERS (which was used to measure difficulties with emotion regulation by seven of the 19 studies in the current review) reflect pessimism about one's capacity to influence emotions (e.g., 'When I am upset, I believe that I will remain that way for a long time' and 'When I'm upset, I believe that there is nothing I can do to make myself feel better').

Individuals that endorse subjugation and emotional inhibition schemas are considered likely to suppress negative affect (Young et al., 2003). The subjugation schema is theorized to consist of a facet related to suppressing one's emotions because of the fear that privileging one's emotions over others may result in retaliation or abandonment by others or being subjected to the anger of others.

Similarly, those who endorse emotional inhibition constrain their abilities to recognize and express emotions to minimize being criticized or judged as someone who is unable to control their impulses. However, the endorsement of these beliefs about emotions thwarts people's capacities to experience and adaptively regulate their affective experience (Roth et al., 2019).

4.1 | Clinical implications

Our findings not only have implications for the field of schema therapy but extend to therapeutic approaches that seek to promote affective functioning by addressing maladaptive cognitions. The current findings provide insights into the schema domains and EMSs that are likely to feature in the presentation of clients who present with emotion regulation difficulties. A theme apparent in the EMSs most strongly implicated in both alexithymia and emotion regulation difficulties more generally was negative expectations about the future and how they will be treated by others. The finding that harbouring mental representations of others as unreliable and untrustworthy feature in individuals with emotion regulation difficulties provides insights as into the mental representations that need to be targeted when working with individuals with emotion regulation difficulties.

In the context of schema therapy, imagery rescripting targeting the childhood memories that underpin these EMSs is likely to be particularly useful. Imagery rescripting is an experiential intervention that can be used to help clients develop an alternative (and more adaptive) mental representation of a past life experience. Imagery rescripting that includes opportunities for the client to safely embody and express the emotions they were unable to safely express at the time of the actual event may be particularly important (Hofmann, 2015; Stevens, 2019).

However, research is needed to identify the precise mechanisms of change across the various treatment approaches known to effect emotion regulation (Gratz et al., 2015). It is not clear whether schema therapy influences emotion regulation, whether changes in emotion regulation mediate treatment outcomes, or whether a more explicit focus on emotion regulation skills is needed. Although some authors have called for dialectical behavior therapy skills to be integrated into schema therapy to more directly address emotion regulation skills (Fassbinder et al., 2016; Montgomery-Graham, 2016), it is not yet known whether integrating a more explicit focus on basic emotion regulation skills, such as distress tolerance (Ke & Barlas, 2020), produces greater therapeutic gains (Yakin et al., 2019).

4.2 | Strengths, limitations and directions for future research

This meta-analysis has several strengths, including its compliance with the PRISMA statement, which facilitates transparent reporting and improves the methodological rigour of the review. However, the findings need to be interpreted within the context of limitations inherent

in the evidence base, as well as limitations specific to the review methods. First, the number of studies that could be meta-analysed was modest, and none of the pooled sample sizes exceeded 2000. This also limited our ability to statistically test for differences in the magnitude of associations between difficulties regulating emotions, alexithymia and EMSs. Although power analyses indicated adequate power for the estimation of each effect size, it is clear that further research is needed, particularly regarding alexithymia and its association with schema domains, as this was examined by only two studies.

Second, the studies in this review tended to assess emotion regulation as a single global outcome using self-report questionnaires such as overall DERS scores (Gratz & Roemer, 2004). However, in their review of the literature, Naragon-Gainey et al. (2017) identified that emotion regulation cannot be reduced to a single overarching strategy or process but rather, a set of distinct strategies/processes, such as acceptance, mindfulness, and experiential avoidance of emotions. Future research could investigate whether EMSs vary in the degree to which they are associated with various emotion regulation strategies. For example, the emotional inhibition schema may be more strongly associated with down-regulating strategies, such as experiential avoidance and emotion suppression, while the abandonment schema may be more strongly related to affect regulation strategies that intensify the experience of negative affect and distress, such as rumination (Mikulincer et al., 2003).

Third, the studies reported in this quantitative review were all cross-sectional; thus, it is unclear whether the magnitude of the associations estimated in this paper would be evidenced in studies that tracked these associations across time. To this end, it is important that future research studies focus on developing longitudinal studies. Furthermore, given that emotion regulation, in particular, is considered a dynamic process that is sensitive to context (Mikulincer et al., 2003), future studies could also use ecological momentary assessments (Boemo et al., 2022; Conner et al., 2009) to enhance our understanding of the prospective and time-variant associations between contextual triggers associated with EMS activation, affective experiences, and emotion regulation difficulties in daily life. Experimental designs could be used to examine whether the effectiveness of affect regulation strategies is influenced by contexts designed to induce schema activation.

Fourth, there was high heterogeneity evident in some analyses, and we were unable to complete subgroup analyses to explore possible moderators such as YSQ version or sample characteristics. For example, only four studies recruited gender-balanced samples, while most studies recruited females. Future studies should examine potential gender differences in the associations between EMSs and emotion regulation, particularly given evidence that men and women may differ in their use of emotion regulation strategies (Goubet & Chrysikou, 2019). Samples from diverse clinical and health settings (e.g., chronic pain patients) were combined with community samples, and this may have contributed to inconsistency in study findings as levels of emotion regulation difficulties may differ between psychiatric and general population samples. Unmeasured differences in coping may also contribute to the between-study variation in the

strength of the reported associations. Despite the centrality of coping styles and responses to the schema therapy model, few studies have examined the inter-relationships between coping, emotion regulation processes, and EMSs (Pilkington et al., 2023). This warrants further investigation.

Finally, publication bias was not examined as the meta-analyses did not exceed 10 effect sizes (Higgins et al., 2019). As the inclusion criteria required that studies were published in English in peer-reviewed journal articles, relevant studies in languages other than English, unpublished research, dissertations and grey literature were omitted. Nonetheless, we aimed to establish the status of published research, and efforts to translate articles into English are susceptible to errors (Balk et al., 2013).

4.3 | Conclusion

Using a systematic approach and meta-analyses, this review identified that emotion regulation difficulties and alexithymia are strongly related to EMSs. The findings suggest that emotion regulation problems and alexithymia are prominent in individuals who hold disproportionate expectations that their needs for safety, predictability, acceptance and secure attachment will not be met. A pessimistic orientation, encompassing a perception that the world and what happens in the world is uncontrollable, and inevitably bad, plays an important role in difficulties regulating affective experience. The results have important implications for future efforts seeking to bridge emotion-focused and cognitive therapeutic approaches.

CONFLICT OF INTEREST STATEMENT

None to declare.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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