

A systematic review of the relationship between alexithymia and emotional eating in adults

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ABSTRACT

Elucidating psychological characteristics associated with emotional eating may further inform interventions for this behaviour related to eating psychopathology. The present systematic review aimed to examine the relationship between alexithymia and self-reported emotional eating in adults, and provide a narrative synthesis of the existing literature. Using the PRISMA method for systematic reviews, six databases (MEDLINE, PsycInfo, PsycArticles, PubMed, SCOPUS, and Web of Science) were searched for peer-reviewed, quantitative research published between January 1994 and 20th July 2021, when the searches were conducted. Eligible articles investigated the association between alexithymia, as measured by the Toronto Alexithymia Scale (Bagby, Parker, & Taylor, 1994), and emotional eating, as measured by any validated self-report instrument. Nine cross-sectional articles were reviewed, and risk of bias was assessed using the Appraisal Tool for Cross-Sectional Studies (Downes, Brennan, Williams, & Dean, 2016). A narrative synthesis of articles suggests positive associations between alexithymia and self-reported emotional eating. Five measures of emotional eating were used across articles, with limited but consistent evidence for the relationship between alexithymia and emotional eating as measured by the Dutch Eating Behaviour Questionnaire (Van strien et al., 1986). Further research is required to add evidence to the nature of the relationship between alexithymia and emotional eating, and to explore mechanisms that might underpin any relationships. Understanding the association between alexithymia and emotional eating may support strategies and interventions for those seeking help for emotional eating and related eating behaviours.

1. Introduction

Sifneos (1973) coined the term alexithymia (may be translated from the Greek *a* [no] – *lexis* [words] – *thymia* [emotion]; literal meaning “no words for emotion”) to describe a cluster of characteristics, which reflect the experience of difficulties processing emotions at cognitive and affective levels (Goerlich, 2018). It is considered a personality trait (Luminet, Bagby, & Taylor, 2001) with salient features of: (a) difficulty identifying feelings (DIF) and distinguishing between feelings and bodily sensations of arousal; (b) difficulty describing feelings (DDF) to other people; (c) constricted imaginal processes (IMP) evidenced by a paucity of fantasy; and (d) a stimulus-bound, externally oriented cognitive style (EOT; Taylor & Bagby, 2000). The prevalence of alexithymia is around 10% within the general population (Honkalampi et al., 2017; Kokkonen et al., 2001; Salminen, Saarijärvi, Äärelä, Toikka, & Kauhanen, 1999), with higher reported levels observed within

psychiatric populations (McGillivray, Becerra, & Harms, 2017), including those with eating disorders and non-clinical levels of disordered eating.

The relationship between alexithymia and eating disorders has been examined by a systematic review (see Nowakowski, McFarlane, & Casin, 2013) and meta-analysis (see Westwood et al., 2017), with findings highlighting higher levels of alexithymia in populations with eating disorders compared to healthy controls. Individuals with anorexia nervosa or binge eating disorder reported significantly greater affective (i.e. DIF, DDF) but not cognitive (i.e. EOT) characteristics than control groups (Pinaquy, Chabrol, Simon, Louvet, & Barbe, 2003; Taylor, Parker, Bagby, & Bourke, 1996). The presence of alexithymia is related to poorer clinical and treatment outcomes in patients with eating disorders (Pinna, Sanna, & Carpiniello, 2015; Speranza, Loas, Wallier, & Corcos, 2007).

Positive associations have also been identified between alexithymia

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and subclinical eating psychopathology (Ridout, Thom, & Wallis, 2010). A recent review of studies with non-clinical samples of children and adolescents identified distinct domains of emotional regulation, including difficulty describing feelings, as predictive factors of over-eating behaviour (Favieri, Marini, & Casagrande, 2021), although not all studies employed specific measures of alexithymia. Emotional eating, commonly conceptualised as “the tendency to overeat in response to negative emotions” (van Strien et al., 2007, p. 106), is an important clinical dimension for eating psychopathology (Ricca et al., 2012) and may predict binge eating (Pinaquy et al., 2003; Stice, Presnell, & Spangler, 2002). It has been proposed that emotional eating may better refer to eating when negative emotions are regulated in unhealthy ways, rather than simply eating in response to negative emotions (Evers, Marijn Stok, & de Ridder, 2010). Affective characteristics of alexithymia (i.e., DIF and DDF) have been found to significantly predict self-reported emotional eating in samples of women with binge eating disorder (Pinaquy et al., 2003). Other research within non-clinical populations found these characteristics to exert their effects indirectly on self-reported emotional eating through emotion dysregulation, with an absence of any direct effects (McAtamney, Mantzios, Egan, & Wallis, 2021). Emotion dysregulation refers to a relative absence of adaptive emotion regulation techniques (Gratz & Roemer, 2004). Whilst there is minimal overlap between DIF and awareness of emotions (a characteristic of emotion dysregulation), the constructs of alexithymia and emotion dysregulation are considered independent (Pandey, Saxena, & Dubey, 2011).

Existing literature exploring the association between alexithymia and emotional eating in adults has not been systematically reviewed to ascertain any trends. A comprehensive examination of this relationship will offer further understanding of the psychological characteristics that relate to emotional eating and potentially influence intervention outcomes when targeting emotion regulation and associated behaviours (i.e., emotional eating). There are issues with the validity of self-report measures of emotional eating, beyond the general limitations of self-report measures (see Paulhus & Vazire, 2007). For example, triple recall bias may present a risk as participants must retrospectively recall their emotions, eating behaviours and connections between the two (Evers, de Ridder, & Adriaanse, 2009). Furthermore, the concept of emotional eating is disputed, as researchers are failing to observe changes in eating behaviours in individuals considered to be emotional eaters based on self-report measures (Adriaanse, de Ridder, & Evers, 2011; Altheimer, Giles, Remedios, Kanarek, & Urry, 2021; Bongers & Jansen, 2016; Braden, Emley, Watford, Anderson, & Musher-Eizenman, 2020). Considering these limitations of the conceptualisation and operationalisation of emotional eating, the scope of the present review is limited to literature using self-report methods only.

1.1. Objectives

This review aimed to examine the relationship between alexithymia and self-reported emotional eating in adults, through a narrative synthesis of existing literature.

2. Methods

2.1. Search strategy

The systematic review was conducted according to the PRISMA 2020 Statement (Page et al., 2021). On the 20th July 2021, electronic databases were searched systematically for original research articles published in peer-reviewed journals. Truncated terms relating to alexithymia and emotional eating were used with Boolean operators (see Table 1). Results were independently screened for relevance by two reviewers (KM, DJW), first by title and then by abstract. If the abstract indicated eligibility, full texts were retrieved to determine inclusion or exclusion.

Table 1

Search string used to systematically search electronic databases for relevant articles. Bold terms indicate Boolean operators.

Search String	Databases Searched
("alexithymia" OR "alexithymic" OR "alexithymi*" OR "toronto alexithymia scale" OR "difficulty identifying feelings" OR "difficulty describing feelings" OR "difficulty identifying emotions" OR "difficulty describing emotions") AND ("emotional eat*" OR "emotional overeat*" OR "stress eat*" OR "comfort eat*")	MEDLINE, PsycInfo, PsycArticles, PubMed, SCOPUS, Web of Science

2.2. Eligibility criteria

Articles were considered if they included quantitative observational or experimental research, were written in English, and were published in peer-reviewed journals. Conference abstracts or letters, clinical guidelines, book chapters, reviews which do not use original data, and dissertations or theses were not included. Articles with any adult clinical or nonclinical populations of interest were eligible for inclusion if they clearly reported associations between alexithymia and emotional eating.

Due to ongoing discussion surrounding the conceptualisation and operationalisation of alexithymia (see Taylor & Bagby, 2021), alexithymia must have been measured using the twenty-item version of the Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994) to be included in the present review. Earlier versions of this scale were not included due to their psychometric shortcomings (Bagby, Parker, & Taylor, 2020). Searches were limited to research published since 1994, the publication year of the TAS-20. As aforementioned, only self-reported emotional eating using previously validated measures was examined; these measures capture how individuals perceive changes in their eating behaviour in response to emotional states.

2.3. Data extraction and quality assessment

A data extraction form was created to compile and standardise the following information from each included article: authors, year of publication, location, research design, sample characteristics, recruitment methods, measures of alexithymia and emotional eating, and reported associations between variables. A finding was deemed statistically significant when $p < .05$ was reported.

Risk of bias was assessed to evaluate how the methodology may have affected the results and reporting of the research. Included articles were all cross-sectional design, so only the Appraisal Tool for Cross-Sectional Studies (AXIS; Downes et al., 2016) was employed. The AXIS outlines, for each article, 20 items considering the clarity of rationale and methodology, reporting of results, and ethical dimensions. Items are answered with 'yes', 'no', or 'do not know', with higher scores reflecting higher quality. Two authors evaluated risk of bias, with any discrepancies discussed and resolved by consensus.

2.4. Data synthesis

Narrative synthesis was used to bring together findings of included articles relating to any association between alexithymia and emotional eating. This method is appropriate for use with emotional eating literature due to heterogeneity of data resulting from the use of various measures.

3. Results

3.1. Search results

The process of determining article eligibility is outlined in Fig. 1. Initial database searches identified 139 articles, with six further articles

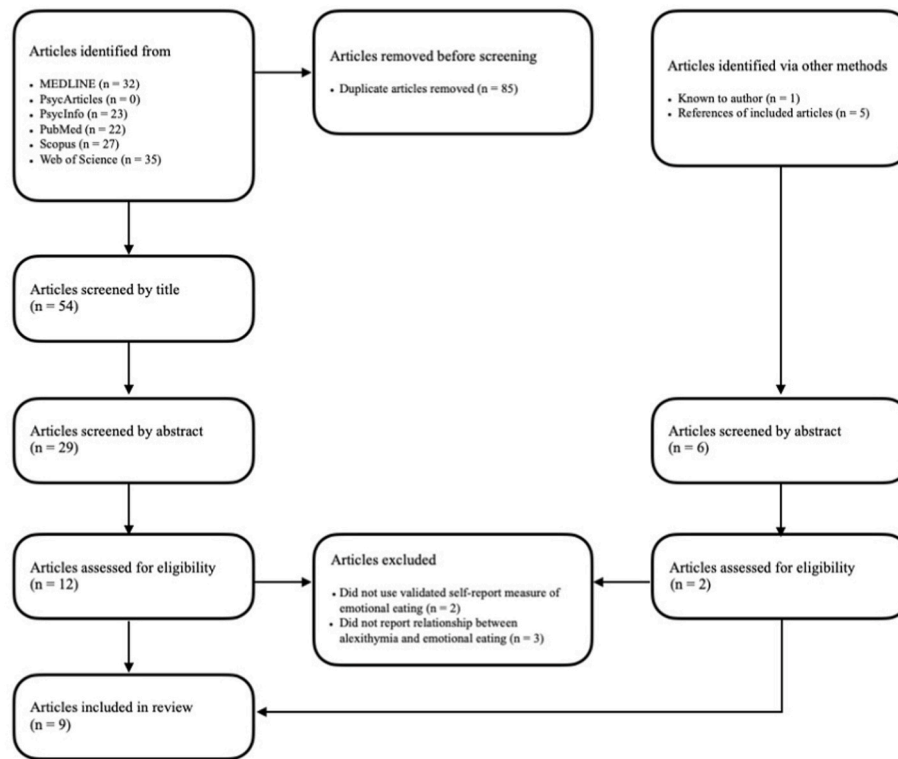


Fig. 1. PRISMA 2020 Flow Diagram illustrating the process of selecting articles.

identified from other sources. Of the 35 titles considered potentially eligible, 14 were accepted based on their abstracts. Five full-text articles were excluded (see Table 2), and nine eligible articles were included in the narrative synthesis.

3.2. Characteristics of included articles

Nine cross-sectional articles published between 2003 and 2021 were included. Sample sizes used in the analyses ranged from 40 to 549, totalling 2754 participants across all articles. Two articles investigated the relationship between alexithymia and emotional eating in university populations (Lyvers, Brown, & Thorberg, 2019; Pink, Lee, Price, & Williams, 2019), one of which replicated the research with a general population sample (Pink et al., 2019). Three further articles examined alexithymia and emotional eating within general population samples (Cecchetto, Aiello, Gentili, Ionta, & Osimo, 2021; McAtamney et al., 2021; Strodl & Wylie, 2020). Three articles sampled only individuals living with obesity (Larsen, van Strien, Eisinga, & Engels, 2006; Pinaquy et al., 2003; Zijlstra et al., 2012), one of which grouped participants based on whether they met criteria for binge eating disorder or not (Pinaquy et al., 2003). One article recruited participants who were concerned about their weight (Ouwens, van Strien, & van Leeuwe, 2009). See Table 3 for key characteristics and methodological quality ratings of included articles.

Table 2
Excluded full-text articles and reasons for exclusion (n = 5).

Reason for exclusion	Article authors
Did not measure emotional eating or use a validated self-report measure of emotional eating	Noli et al. (2010); van Strien and Ouwens (2007)
Did not report the relationship between alexithymia and emotional eating	Spence and Courbasson (2012); Zeeck, Stelzer, Linster, Joos, and Hartmann (2011); Wheeler and Broad (1994)

3.3. Quality of included articles

Methodological quality is reported individually for both studies conducted within the article by Pink et al. (2019). All articles met 11 or more of the outlined criteria, meaning quality was at least moderate. All articles failed to meet criteria related to addressing and categorising, or describing non-responders. Three articles did not report details of ethical approval nor of obtaining consent from participants (Larsen et al., 2006; Ouwens et al., 2009; Pinaquy et al., 2003). Only two articles justified their sample size (Strodl & Wylie, 2020; Zijlstra et al., 2012). Reported results appear internally consistent for most articles, with data clearly reporting the sample size. All articles had generally a low risk of bias. One study reported additional analyses within the discussion, conducted using participants excluded from the main analyses for reporting having a current or past eating disorder (Cecchetto et al., 2021). The authors acknowledged the limitations of these additional analyses, due to them being outside the aim of the study and the small sample size (n = 35). As such, the additional analyses were not included in the present review.

3.4. Associations between alexithymia and emotional eating

Alexithymia was measured across all articles using the TAS-20, as either total scores or individual subscale scores. Emotional eating was measured with four different self-report scales: the emotional eating subscale of the Dutch Eating Behaviour Questionnaire (DEBQ-EE; Van Strien et al., 1986), the Emotional Eating Scale (EES; Arnow, Kenardy, & Agras, 1995), the Salzburg Emotional Eating Scale (SEES; Meule, Reichenberger, & Blechert, 2018), or the Three Factor Eating Questionnaire emotional eating subscale from either the 18-item (TFEQ-R18-EE; Karlsson, Persson, Sjostrom, & Sullivan, 2000) or 21-item revised versions (TFEQ-R21-EE; Tholin, Rasmussen, Tynelius, & Karlsson, 2005). Reported associations from included articles are presented below, grouped by emotional eating measure.

Seven articles reported bivariate correlation analyses between

Table 3
Key characteristics of included articles and methodological quality ratings.

Authors (Year)	Country	Analytical sample size	% Female	Emotional eating measure	Relationship between alexithymia and emotional eating	Methodological quality ratings
Cecchetto et al. (2021)	Italy	General population (n = 365)	73.1	DEBQ-EE	Higher DEBQ-EE scores were found among those with higher TAS-20 scores. DEBQ-EE scores were predicted by the interaction between TAS-20 and quality of life.	15
Larsen et al. (2006)	Netherlands	Individuals living with obesity (n = 410)	82.9	DEBQ-EE	TAS-20 total, DIF and DDF scores positively correlated with DEBQ-EE. No significant correlations between EOT and DEBQ-EE. DIF and DDF were more strongly associated with DEBQ-EE in men than women.	13
Lyvers et al. (2019)	Australia	University students were at least occasional consumers of caffeine products (n = 224)	82.1	DEBQ-EE	TAS-20 total scores positively correlated with DEBQ-EE. TAS-20 total scores were a significant positive predictor of DEBQ-EE.	14
McAtamney et al. (2021)	United Kingdom	General population (n = 136)	64.7	EES, SEES	No significant correlations between TAS-20 total nor subscale scores and total EES scores. There were also no significant correlations with any SEES subscale scores. DIF and DDF each exerted indirect effects on EES total scores, via emotion dysregulation. No significant effects of DIF nor DDF on SEES subscales.	15
Ouwens et al. (2009)	Netherlands	Individuals living with obesity (n = 549)	100	DEBQ-EE	DIF positively correlated with DEBQ-EE. DIF mediated the relationship between depression and DEBQ-EE.	12
Pinaquy et al. (2003)	France	Individuals living with overweight/obesity, with (n = 40) and without (n = 129) binge eating disorder	100	DEBQ-EE	TAS-20 total scores predicted DEBQ-EE in the group with binge eating disorder only. Further analyses with subscales identified that only DIF predicted DEBQ-EE in this group.	11
Pink et al. (2019)	United Kingdom	Study 1: Students (n = 125)	85.6	EES, TFEQ-R18-EE	TAS-20 total and DIF scores positively correlated with EES. No significant correlation between DDF nor EOT with EES. No significant correlations between TAS-20 total nor subscale scores and TFEQ-R18-EE.	15
		Study 2: General population (n = 342)	81.2	EES, TFEQ-R18-EE	TAS-20 total, DIF and DDF scores each positively correlated with EES and TFEQ-R18-EE. No significant correlation between EOT and either measure of emotional eating.	14
Strodl and Wylie (2020)	Australia	General population (n = 332)	90.7	TFEQ-R21-EE	Both DIF and DDF were positively correlated with TFEQ-R21-EE.	17
Zijlstra et al. (2012)	Netherlands	Individuals with obesity (n = 102)	100	DEBQ-EE	Positive correlation between DIF and DEBQ-EE, which became non-significant after correcting for external and restrained eating scores. No significant correlation between DDF and DEBQ-EE.	17

Note: DEBQ-EE = Dutch Eating Behaviour Questionnaire, emotional eating subscale. EES = Emotional Eating Scale. SEES = Salzburg Emotional Eating Scale; TFEQ-R18-EE = Three Factor Eating Questionnaire, revised 18-item version, emotional eating subscale. TFEQ-R21-EE = Three Factor Eating Questionnaire, revised 21-item version, emotional eating subscale. TAS-20 = Toronto Alexithymia Scale. DIF = Difficulty Identifying Feelings subscale. DDF = Difficulty Describing Feelings subscale.

alexithymia and emotional eating scores. Eight articles reported effects of alexithymia on emotional eating, and one article reported effects of emotional eating on alexithymia. All articles included report relationships from cross-sectional studies.

3.4.1. DEBQ-EE

The emotional eating subscale of the DEBQ comprises 13 items corresponding to the desire to overeat in response to negative emotions. Lyvers et al. (2019) reported a positive relationship of medium strength between total TAS-20 scores and emotional eating ($r(222) = 0.21, p < .01$). Larsen et al. (2006) reported a stronger relationship in males ($r(68) = 0.40, p < .01$) than females ($r(338) = 0.18, p < .01$). When exploring TAS-20 subscales, they reported that DIF and DDF were also more strongly related to emotional eating in males (DIF $r(68) = 0.50, p < .001$; DDF $r(68) = 0.41, p < .001$) than females (DIF $r(338) = 0.28, p < .001$; DDF $r(338) = 0.17, p < .01$), whilst EOT was not significantly related to emotional eating in males ($r(68) = -0.07, n.s.$) nor females ($r(338) = -0.05, n.s.$). Ouwens et al. (2009) reported a significant positive correlation between DIF and emotional eating ($r(547) = 0.34, p < .01$), as did Zijlstra et al. (2012) ($r(100) = 0.35, p < .01$) although this became non-significant after accounting for external and restrained eating as measured by the DEBQ ($r(100) = 0.19, p = .06$). They did not find a significant relationship between DDF and emotional eating ($r(100) = 0.18, n.s.$).

Among the general population sample, Cecchetto et al. (2021)

reported higher desire toward emotional eating among individuals with higher TAS-20 scores ($X^2(1) = 7.91, p = .005$). Post-hoc analyses identified a significant interaction between TAS-20 scores and quality of life ($X^2(1, N = 365) = 4.70, p = .030$; researchers defined quality of life with a measure combining quality and quantity of personal space at home and family income, see Cecchetto et al., 2021 for details), in which higher TAS-20 scores were associated with higher emotional eating among individuals with higher quality of life ($t(482) = 3.88, p < .001$), while TAS-20 scores did not exert effects on emotional eating in individuals with lower quality of life. Lyvers et al. (2019) found that after controlling for demographic variables (i.e. age, gender, education), alexithymia (as TAS-20 total scores) predicted emotional eating ($F_{\text{change}}(1, 219) = 10.29, p = .002$), the presumed mediator in the tested model examining effects of alexithymia on caffeine consumption. The final model was not significant. A separate hierarchical regression was conducted to assess predictors of emotional eating, in which they found alexithymia to be a significant predictor contributing 5% of the variance ($F_{\text{change}}(1, 217) = 11.10, p < .001$). Pinaquy et al. (2003) reported that TAS-20 total scores significantly predicted emotional eating ($B = 0.365, p = .005$), with further analyses with subscales identifying DIF as the only significant predictor ($B = 0.77, p = .001$). These findings were reported for the group with binge eating disorder, whilst no significant associations were reported for those without binge eating disorder. Larsen et al. (2006) explored the association between alexithymia and emotional eating in males and females, reporting significant interactions

between gender and both DIF ($F_{\text{change}}(1, 403) = 5.31, p = .02$) and DDF ($F_{\text{change}}(1, 403) = 7.70, p = .006$), but not EOT. Subscales of DIF and DDF were categorised as high and low, with higher scores on each specifically associated with greater levels of emotional eating in men than women. [Ouwens et al. \(2009\)](#) reported a potential indirect effect of depression on emotional eating *through* DIF, in which depression predicted DIF ($B = 0.60, p < .01$) and in turn DIF predicted emotional eating ($B = 0.14, p < .01$).

[Lyvers et al. \(2019\)](#) also tested the reverse of the model which assessed the alexithymia-caffeine relationship via emotional eating, instead assessing effects of emotional eating on caffeine consumption via alexithymia. In this model, they found that emotional eating was a predictor of alexithymia when added to the model after demographic variables ($F_{\text{change}}(1, 219) = 10.29, p = .002$). The final model was significant, indicating potential mediation in this direction. Of relation to the present review, this was the only article to investigate and report the effects of emotional eating on alexithymia.

3.4.2. EES

This scale comprises 25 items that measure *urges* to eat in response to negative emotions, used as either a total score or individual subscale scores for depression, anxiety, and anger. [Pink et al. \(2019\)](#) reported a positive correlation between TAS-20 and EES total score within both the student sample ($r(123) = 0.176, p < .05$) and the general population sample ($r(340) = 0.217, p < .01$). When looking at TAS-20 subscales, DIF correlated with EES in the student ($r(123) = 0.203, p < .05$) and general population sample ($r(340) = 0.265, p < .001$), whilst DDF correlated with EES only in the general population sample ($r(340) = 0.174, p < .001$). The correlation between DDF and EES in the student sample was not significant ($r(123) = 0.085, n.s.$). The EOT subscale did not correlate with EES in either the student sample ($r(123) = 0.115, n.s.$) nor the general population sample ($r(340) = 0.058, n.s.$). However, [McAtamney et al. \(2021\)](#) did not report any significant correlations between TAS-20 (total nor subscales) and EES total scores (TAS-20 $r(134) = 0.123, n.s.$; DIF $r(134) = 0.124, n.s.$; DDF $r(134) = 0.072, n.s.$; EOT $r(134) = 0.086, n.s.$). Four subscales (i.e. depression, anxiety, anger, and somatic arousal) identified by [Goldbacher et al. \(2012\)](#) were used within these analyses. When examining EES subscales, weak correlations were identified between TAS-20 total scores and EES subscales of anger ($r(134) = 0.149, p < .05$) and somatic symptoms ($r(134) = 0.142, p < .05$), as well as DIF and depression ($r(134) = 0.146, p < .05$), and EOT and anger ($r(134) = 0.153, p < .05$). When examining the effects of DIF and DDF on EES total scores, they did not identify a significant direct effect. However, positive indirect effects were reported for both DIF ($B = 0.671, 95\%CI = 0.0452, 1.2178$) and DDF ($B = 0.736, 95\%CI = 0.1924, 1.3360$) on EES, through emotion dysregulation.

3.4.3. SEES

This 20-item scale measures perceived over- and under-eating behaviour in response to negative and positive emotions, using subscale scores of happiness, sadness, anger and anxiety. [McAtamney et al. \(2021\)](#) reported no significant correlations between TAS-20 (total nor any subscale) with any subscales of the SEES (see supplementary material for statistics). Further, there were no direct nor indirect effects of DIF nor DDF, via emotion dysregulation, on any SEES subscales.

3.4.4. TFEQ-EE

The TFEQ-R18-EE comprises three items measuring self-reported emotional eating behaviour, whilst the TFEQ-R21-EE comprises six items. [Pink et al. \(2019\)](#) reported that the relationship between TAS-20 total and TFEQ-R18-EE scores was not significant for the student sample ($r(123) = 0.076, n.s.$) but was significant for the general population sample ($r(340) = 0.135, p < .05$). Neither DIF nor DDF significantly correlated with TFEQ-R18-EE scores in the student sample (DIF $r(123) = 0.074, n.s.$; DDF $r(123) = 0.018, n.s.$), but weak correlations were significant in the general population sample (DIF $r(340) = 0.180, p <$

$.001$; DDF $r(340) = 0.218, p < .05$). Emotional eating did not significantly relate to EOT in either the student sample ($r(123) = 0.090, n.s.$) nor the general population sample ($r(123) = -0.004, n.s.$). [Strodl and Wylie \(2020\)](#) reported weak correlations between TFEQ-R21-EE and both DIF ($r(330) = 0.20, p < .001$) and DDF ($r(330) = 0.11, p < .05$). They also tested whether these affective characteristics mediated the effects of forms of childhood trauma on emotional eating, but no significant indirect effects were identified.

4. Discussion

The present systematic review aimed to synthesise findings of published research articles that examined the association between alexithymia and self-reported emotional eating. Despite a general paucity of research examining the association between these variables, nine articles were identified as eligible for inclusion. The DEBQ-EE was the most frequently used measure of emotional eating, and used within six articles. Two articles employed the EES, whilst the SEES, TFEQ-R18-EE and TFEQ-R21-EE were each employed only once.

Reported results from articles using the DEBQ-EE to measure emotional eating generally indicate a positive relationship with alexithymia as total scores or affective characteristic subscale scores ([Larsen et al., 2006](#); [Lyvers et al., 2019](#); [Ouwens et al., 2009](#); [Zijlstra et al., 2012](#)). A higher desire to eat when in an emotional state was identified among those with higher alexithymia total scores ([Cecchetto et al., 2021](#)). Results also provide preliminary support for the role of alexithymia in predicting emotional eating, as measured by the DEBQ-EE ([Lyvers et al., 2019](#); [Ouwens et al., 2009](#); [Pinaquy et al., 2003](#)), with potential gender differences in the strength of association between affective alexithymia characteristics and emotional eating (i.e. a stronger association in males; [Larsen et al., 2006](#)).

Reported results from articles using the EES were mixed in their support for the association between variables. Significant relationships were found between alexithymia (total TAS-20, DIF, DDF) and emotional eating across general population and student samples, with the exception of DDF in the student sample ([Pink et al., 2019](#)). Other findings did not identify a clear relationship between alexithymia (total nor subscale scores) and emotional eating, but did report possible indirect effects of DIF and DDF on emotional eating *through* emotion dysregulation ([McAtamney et al., 2021](#)).

The TFEQ-R18-EE, TFEQ-R21-EE and SEES were each used by one article. Limited findings report no significant associations between alexithymia and SEES subscale scores ([McAtamney et al., 2021](#)), nor with TFEQ-R18-EE scores in a student sample ([Pink et al., 2019](#)). However, within general population samples, weak correlations were identified between affective alexithymic characteristics and TFEQ-R18-EE ([Pink et al., 2019](#)) and TFEQ-R21-EE scores ([Strodl & Wylie, 2020](#)).

Overall, existing research indicates there may be a positive association between alexithymia (as TAS-20 total, DIF or DDF scores) and DEBQ-EE scores. These findings suggest that higher levels of alexithymia, and its specific affective characteristics, may relate to greater tendencies towards emotional eating. However, only six studies used this measure of emotional eating, so these findings are discussed with caution within this review. Reported results using other emotional eating measures are less consistent and have even fewer articles employing each of the measures. The emotional eating measures used in the included studies focus largely on negative emotions, and the typically used definition of emotional eating refers to increased food consumption in response to negative emotions ([van Strien et al., 2007](#)). However, emotional eating is also found to occur in response to positive emotions ([Cardi, Leppanen, & Treasure, 2015](#)) and may be unrelated to the poor physical and psychological outcomes implicated in negative emotional eating ([Braden, Musher-Eizenman, Watford, & Emley, 2018](#); [Meule et al., 2018](#)). Only the SEES measure considers positive emotions (happiness subscale), of which only one study reported the association

with alexithymia and this was non-significant (McAtamney et al., 2021). There is a paucity of research examining alexithymia and differences in difficulty identifying/describing positive versus negative feelings. An interesting avenue for future research would be to explore whether there are differences here in how this may affect food intake in response to positive and negative emotions, particularly as positive emotional eating and negative emotional eating are considered to be different constructs (van Strien et al., 2013).

Three articles recruited only female participants (Ouwens et al., 2009; Pinaquy et al., 2003; Zijlstra et al., 2012), and four of the remaining six articles comprised at least 81% female samples. Larsen et al. (2006) explored gender differences and identified that there was a stronger relationship between alexithymia and emotional eating in males than females. However, their sample was only 17% male ($n = 40$), and to date there has been no further research to explore these differences. Longitudinal research within a sample of adolescents found an association between breastfeeding duration and emotional eating which was mediated by difficulty identifying feelings; this was significant for boys, but not girls (van Strien, Beijers, Smeekens, & Winkens, 2019). This highlights the need to understand sex/gender-differences in the relationship between alexithymia and emotional eating across the lifespan, and particularly further research within samples of non-female adults.

Included articles reported associations between alexithymia and emotional eating, but there was limited examination of mechanisms underpinning the association. McAtamney et al. (2021) reported the specific indirect effect of alexithymia on emotional eating through emotion dysregulation. Two models were presented, with DIF and DDF as predictors, but in each model only about 14% of variance in emotional eating was explained. Two mechanisms of how alexithymia relates to emotional eating have been proposed: (1) alexithymia as a deficit in interoceptive awareness results in insensitivity to satiety cues, thus eating in response to other bodily sensations such as emotional arousal; and (2) eating as a way of regulating negative affective states which are common in alexithymia, thus representing maladaptive emotion regulation. However, these are not necessarily mutually exclusive (Lyvers et al., 2019). Both of these mechanisms could be supported through learning to identify and respond to emotions adaptively.

Teaching emotion regulation skills may result in decreased emotional eating (Roosen, Safer, Adler, Cebolla, & van Strien, 2012), but for individuals with higher levels of alexithymia focusing on the affective characteristics should take priority as the ability to identify and understand emotions is a logical prerequisite to developing skills to regulate them (Vine & Aldao, 2014). Emotional eating is important to explore given its association with eating psychopathology (Pinaquy et al., 2003; Ricca et al., 2012; Stice et al., 2002), and understanding related psychological characteristics is important to help inform the development of strategies to manage it. The identification of preliminary support for an association between alexithymia and emotional eating is useful, as the presence of alexithymia may present a barrier to psychotherapeutic treatment approaches (Lumley, Neely, & Burger, 2007) and relates to less favourable outcomes (Pinna et al., 2015).

The present review reported the results of a comprehensive search of existing research, systematically searching key databases for research articles. Two reviewers independently screened articles for eligibility, and evaluated methodology of those included. However, inclusion of articles was limited to those published in peer-reviewed journals and in English, which may have resulted in publication bias and potential overestimation of any association between variables. Five additional articles were identified from the references of other articles, which potentially highlighted limitations in the search criteria. However, upon screening it was noted that they did not examine alexithymia and emotional eating, which explains their absence from the search results. Whilst in general, reviewed articles indicated that alexithymia may predict emotional eating as measured by the DEBQ-EE, one article also

found that emotional eating predicted alexithymia (Lyvers et al., 2019). Due to the limited number of articles, all of which are cross-sectional, causation between alexithymia and emotional eating cannot be inferred and indication of support for the relationship is discussed with caution.

Five different self-report measures of emotional eating were used in the included articles. The authors discussed and discounted conducting a meta-analysis, instead favouring a narrative synthesis for two key reasons. Firstly, the heterogeneity from different measures and the limited number of articles employing each measure. Secondly, given the limitations of self-report measures of emotional eating the authors felt that the findings of a meta-analysis with the included studies would not offer meaningful conclusions. Issues with the validity of self-report retrospective measures of emotional eating have been identified (for a review, see Bongers & Jansen, 2016), and specifically there may be a triple recall bias due to the need to recall emotions, eating behaviours, and their association (Evers et al., 2009). Other research has proposed that when retrospectively asking about emotional eating behaviours, participants may be attributing past overeating to emotions retroactively, rather than accurately reporting emotional eating retrospectively (Adriaanse, Prinsen, de Witt Huberts, de Ridder, & Evers, 2016). As self-report measures of emotional eating do not appear to accurately predict actual food intake when feeling negative (Adriaanse et al., 2011; Althemer et al., 2021; Braden et al., 2020; Bongers & Jansen, 2016), future research should consider research designs in which actual food intake is measured, e.g. observed in laboratory studies or ecological momentary assessments, in addition to self-report questionnaires to explore causality and more accurately inform potential interventions. There is a need to ascertain what objective and subjective emotional eating measures are measuring to better understand research using these measures.

The present review included only quantitative research using the TAS-20 which is considered the gold-standard of alexithymia self-report measurement. Whilst issues have been discussed in relation to its validity and reliability, particularly the measurement of the EOT and IMP features of alexithymia (Kooiman, Spinhoven, & Trijsburg, 2002), a recent meta-analysis demonstrated support for the three-factor structure originally proposed by Bagby et al., in 1994 (Schroeders, Kubera, & Gnambs, 2021). Despite recommendations to use the TAS-20 alongside other self-reported and observer-rated measures (Bagby et al., 2020; Kooiman et al., 2002), this is not commonly used and was not exhibited by any of the studies included in this review.

Further research using gold-standard, validated and consistent measures of alexithymia and emotional eating, administered with recommended methods, is required to provide stronger evidence for the nature of the relationship and enable feasibility of a meta-analysis to examine the statistical relationship between variables. Considering these limitations, qualitative work to explore experiences of alexithymia and emotional eating would also be valuable to further elucidate the nature of any associations between these constructs.

5. Conclusions

These findings add to extant literature through highlighting current evidence into the association between alexithymia and emotional eating. The included evidence considered from nine articles provides preliminary support for a positive relationship between alexithymia and emotional eating, most frequently as measured by the DEBQ-EE as a desire to eat more in response to negative emotions. The review has highlighted the need for further research to evidence and examine underlying mechanisms across more diverse samples. This would have to potential to subsequently inform support strategies to reduce emotional eating in alexithymic populations.

Ethical statement

This article does not contain any studies or experiment involving human participants performed by any of the authors.

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Contributors

Author KM undertook the electronic literature searches, and Authors KM and DJW screened articles for inclusion. Author KM collected data from articles and Authors KM and DW assessed articles for risk of bias. Author KM wrote the first draft of the manuscript and all authors

contributed to and have approved the final manuscript.

Other information

The PRISMA 2020 Statement requires the present review to specify that it was not registered, and a protocol was not prepared.

Availability of data and other materials

Data collection forms and data extracted from included articles can be provided upon request.

Declaration of competing interest

All authors declare they have no conflict of interest.

Appendix A. PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Title page
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Appendix B
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Pages 1-2
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 2
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 3
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 3, Page 4
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Pages 2-3
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Pages 2-3
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 4
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 4
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Page 4
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Page 4
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	N/A
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	N/A
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	N/A
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	N/A
	13d	Describe any methods used to synthesise results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Page 4
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	N/A
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	N/A
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	N/A
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	N/A
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Fig. 1 , Page 5
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Table 2
Study characteristics	17	Cite each included study and present its characteristics.	Table 3 , Pages 6-7
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Table 3
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	N/A

(continued on next page)

(continued)

Section and Topic	Item #	Checklist item	Location where item is reported
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Page 7
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	N/A
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	N/A
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	N/A
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	N/A
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	N/A
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Page 13
	23b	Discuss any limitations of the evidence included in the review.	Page 14-16
	23c	Discuss any limitations of the review processes used.	Page 15
	23d	Discuss implications of the results for practice, policy, and future research.	Page 15
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 18
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 18
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	N/A
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 18
Competing interests	26	Declare any competing interests of review authors.	Page 18
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Page 18

Appendix B. PRISMA 2020 for Abstracts Checklist

Section and Topic	Item #	Checklist item	Reported (Yes/No)
TITLE			
Title	1	Identify the report as a systematic review.	Yes
BACKGROUND			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Yes
METHODS			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	Yes
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	Yes
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	Yes
Synthesis of results	6	Specify the methods used to present and synthesise results.	Yes
RESULTS			
Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	Yes
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).	Yes
DISCUSSION			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	No
Interpretation	10	Provide a general interpretation of the results and important implications.	Yes
OTHER			
Funding	11	Specify the primary source of funding for the review.	N/A
Registration	12	Provide the register name and registration number.	N/A

Appendix C. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.appet.2022.106279>.

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