THE UNIVERSITY *of* EDINBURGH

THE UNIVERSITY *of* EDINBURGH

A systematic review of self compassion and stress in parents, and an exploration of emotion regulation and psychopathology in adolescence.

Kelsey Boyle

Doctorate in Clinical Psychology

Supervised by Dr Emily Taylor

The University of Edinburgh

July 2023

Total word count: 16290

Formatted in line with the guidance for the Journal of Child and Family Studies – See Appendix A

Acknowledgements

I would like to take this opportunity to thank those who have helped me in my journey to completing my thesis.

I would first like to thank my research supervisor, Dr Emily Taylor, for her support and guidance throughout this process. I would also like to thank my fellow students for their support through training.

I would also like to thank my family, as their unwavering support has been a great source of strength for me and I am incredibly grateful to have had their encouragement throughout.

Lay Summary

This project looked at how people cope with difficulties and how this is linked to their feelings of stress and wellbeing. This project is made up of two studies, and the first study looked at self compassion and how this was related to stress in parents. Self compassion is how well an individual is able to treat themselves in kind and compassionate way during difficult times. This study reviewed 15 research articles which investigated self compassion and parenting stress, and it found that there was a significant association between self compassion and stress in parents. This means that parents who had high levels of self compassion had lower levels of parenting stress. These findings show us that it is important to think about self compassion when we are trying to understand stress in parents.

The second study in this project focused on emotion regulation and psychopathology in adolescents (from early teenage years up to mid-20s). Emotion regulation is the way in which people try to manage or cope with feelings that they experience. Psychopathology is another word for mental health difficulties, and this study looked at eating difficulties, anxiety and depression. The results of the second study showed that more use of unhelpful emotion regulation strategies was associated with more anxiety and depression. This highlights how important it is to understand how adolescents manage their emotions as it is related to their mental health. Overall, this project showed that self compassion and emotion regulation are important things to consider when thinking about how people cope with difficulties.

Research Project Portfolio Abstract

Background: Self compassion is considered an adaptive coping strategy in the face of stress and is thought to be an important factor in parent functioning. Self compassion can also be understood within an emotion regulation framework. High levels of self compassion and effective emotion regulation have been shown to be associated with lower levels of psychopathology. The adolescent stage is thought to be an important period in the development of emotion regulation and how this relates to psychopathology.

Method: Chapter 1 is a systematic review and meta analysis of the association between self compassion and parenting stress. Chapter 3 explored the relationship between emotion regulation and psychopathology in adolescence using a cross sectional design.

Results: Chapter 1 demonstrated a medium effect size for the association between self compassion and stress in parents, with high levels of self compassion being related to lower levels of stress. Chapter 3 demonstrated that in an adolescent population, dysfunctional emotion regulation is related to symptoms of anxiety and depression, and that age did not appear to moderate this relationship.

Conclusions: This project explored ways of regulating emotions in parent and adolescent populations. Taken together, these findings demonstrate that emotion regulation and self compassion are important concepts in relation to understanding how individuals cope with stress and how this impacts their psychological wellbeing.

Chapter 1

Abstract

Background: Self compassion is associated with psychological wellbeing outcomes and is considered an adaptive coping mechanism in times of stress. High levels of self compassion are also hypothesized to be related to greater levels of adaptive parenting functioning. . The extent of the association between self compassion and parenting stress has not yet been reviewed systematically.

Method: A systematic review of the extant literature was carried out to explore the association between self compassion and parenting stress. Cross sectional/observational studies were considered eligible for inclusion in the review if they had a measure of parent self compassion and parental stress.

Results: This review revealed 15 studies which were eligible for inclusion and meta analysis results demonstrated a medium effect size for the association between self compassion and parenting stress.

Conclusions: Greater levels of self compassion were associated with lower levels of stress in parent populations, and so future research may wish to explore possible mechanisms behind this association.

Introduction

Lower self compassion has been shown to be related to greater psychopathology (MacBeth & Gumley, 2012) and greater self compassion has been shown to be associated with higher levels of psychological wellbeing, such as happiness and positive affect (Neff et al., 2007). Self compassion is also thought be an adaptive way of coping with stress (Allen & Leary, 2010) and self compassion has been theorised as being related to parenting functioning (Lathren et al., 2020). Therefore, the current systematic review aims to explore the research on self compassion and stress in parent/caregiver populations.

Self compassion

Self compassion has attracted interest within the field of psychology due to its apparent association with psychological wellbeing. For example, greater levels of self compassion have been shown to be significantly associated with lower levels of psychopathology in a meta analysis, with a large overall effect size (MacBeth & Gumley, 2012). There have been some different conceptualisations of self compassion within the field but an overarching definition is the as the warmth and care an individual is able to demonstrate towards themselves, especially in the face of difficulties or emotional pain (Neff, 2011). According to Neff (2003a), there are three key components of self compassion: self kindness – being kind towards oneself in the face of difficult times; common humanity – perceiving individual experiences as being part of the wider human experience rather than feeling isolated and alone in this experience; and mindfulness – being able to experience difficult thoughts and feelings without overidentifying with them. Based on this conceptualisation of self compassion, Neff (2003b) developed the self report Self Compassion Scale (SCS; Neff, 2003b). Gilbert (2014) proposed a slightly different conceptualisation of self compassion, highlighting the importance of three affect regulation systems (the threat detection system, the motivational drive system, and the self soothing system), and that individuals who experience warmth and supportive care in early life are better able to activate the self soothing system in the face of difficulties. Both these conceptualisations of self compassion appear to point in the direction of the importance of early interactions with caregivers in the development of compassion towards oneself and view this as a helpful way of coping in the face of difficulties.

Self compassion and stress

Following on from the conceptualisations of self compassion, there has been suggestion that this may act as helpful way of coping with stress (Allen & Leary, 2010). A recent meta analysis conveyed a positive association between self compassion and adaptive coping, and a negative association between self compassion and maladaptive coping (Ewert et al., 2021). Furthermore, one study demonstrated that self compassion moderated the effects of perceived stress, as for participants who scored higher in self compassion, stress was shown to be less strongly related to anxiety, depression and negative affect (Stutts et al., 2018). There have been some investigations into the mechanisms by which self compassion may relate to stress. For example, proactive coping, which refers to how an individual prepares for possible future stressors (Aspinwall & Taylor, 1997), is thought to be one possible key construct in understanding the relationship between self compassion and stress. Bui et al. (2021) found that high levels of proactive coping was associated with high levels of self compassion, and that self compassion mediated the association between proactive coping and perceived stress. They also note that the key aspects of self compassion which were important in mediating this relationship were self kindness, mindfulness and self judgement (Bui et al., 2021), thus providing support for the conceptualisation of self compassion proposed by Neff (2011). It has also been suggested that emotion regulation is an important construct in understanding how self compassion relates to wellbeing. A recent meta-analysis demonstrated that self compassion positively predicted emotion regulation skills as well as some adaptive emotion regulation strategies (i.e. reappraisal and problem solving) and negatively predicted the use of maladaptive emotion regulation strategies (i.e. behavioural avoidance or rumination; Paucsik et al., 2022). Nonetheless, there have been some suggestions that self compassion is not predictive of all aspects of emotional regulation (Allen & Leary, 2010). Paucsik et al. (2022), in their review, found that self compassion was not predictive of the use of distraction, emotional expression, social support, and consumption strategies. Thus, it may be the case that some aspects of self compassion are related to some aspects of emotional regulation. Nonetheless, it is also important to highlight that these associations noted above are correlational, therefore the direction of causality is unclear. In other words, it could be the case that being high in self compassion means that an individual may be able to utilise adaptive ways of coping in the face of difficulties, or it may indicate that being able to use adaptive coping mechanisms promotes higher levels of self compassion.

It has been suggested that self compassion may be related to parenting function, with parents who reported high levels of self compassion also reporting experiencing lower levels of parenting stress (Gouveia et al., 2016). In parents of children with Autism Spectrum Disorder (ASD), higher levels of self compassion were shown to be related to greater self reported wellbeing and lower levels of parenting stress (Torbet et al., 2019). Another study exploring parenting stress in parents of children with ASD demonstrated that higher scores on the positive dimensions of a measure of self compassion (i.e. greater self compassion) were related to better quality of life, whereas higher scores on the negative dimensions of the self compassion measure (i.e. poorer self compassion) were associated with greater levels of stress in parents (Bohadana et al., 2019). It has also been shown that decreasing parenting stress and increasing parent internal locus of control led to positive changes in child outcomes (Moreland et al., 2016). There have also been some studies exploring interventions aimed at improving parental self compassion and how this relates to stress. For example, a randomised controlled trial exploring a very brief intervention aimed at reducing stress in parents found that, when compared to waitlist controls, cognitive reappraisal was more effective at reducing stress in parents than self compassion (Preuss et al., 2021). However, a recent review found that interventions for parents which included components of self compassion led to improvements in parent stress levels, as well as improvements in anxiety and depression in parents (Jefferson et al., 2023). Therefore, the association between parenting stress and self compassion is essential to explore as self compassion has been related to adaptive coping and lower parental stress has been associated with positive factors for both parents and children. Understanding the association between these concepts is important for understanding potential protective factors in relation to adaptive coping in the face of stress.

It could be the case that differences exist between different parental populations with regards to the association between self compassion and parenting stress. For example, some populations may be more likely to experience greater levels of parental stress. Putnick et al. (2010) found that parental stress appeared to increase when children transitioned from the late childhood stage to the adolescent stage. Along with child factors, parental factors have also been shown to be related to parenting stress, with single parents reporting greater parental stress than parents with partners, and parents with poorer physical health reported higher levels of parental stress (Anderson, 2008). A review study found that parents of children with ASD and Developmental Delay reported greater levels of parenting

stress than parents of children with chronic illnesses or behavioural/mood disorders (Barroso et al., 2018). Given that differences appear to exist between different parental populations with regards to parenting stress, and that self compassion has been conceptualised as an adaptive way of coping with stress (Allen & Leary, 2010), it is logical to consider that differences may exist in the relationship between self compassion and parenting stress across different parental populations.

The development of self compassion

In their model, Lathren et al. (2020) begin to explain how self compassion may be related to parenting functioning, and they point to an individual's early interactions and attachment relationship with their caregiver as being particularly important (Lathren et al., 2020; Neff & McGehee, 2010). The theoretical model proposed by Lathren et al. (2020) posits that these early child-caregiver interactions become internalised, and if the individual receives warm, consistent care, they may be better able to demonstrate the same warmth and care towards themselves at difficult times. This model then suggests that being able to be self compassionate as a parent may impact on how they respond to their child's responses to emotional experiences and distress, which then in turn impacts upon the child's attachment orientation and subsequently their ability to be self compassionate (Lathren et al., 2020). Neff and McGehee (2010) found that adolescent attachment security predicted self compassion, with more secure attachment orientation demonstrating greater levels of self compassion in an adolescent sample. This provides clear support for the model proposed by Lathren et al. (2020) as it highlights the importance of attachment security in regards to self compassion. Furthermore, a recent review by Lathren et al. (2021) found that positive self compassion was associated with secure attachment, although they highlight that their findings are not indicative of a cause and effect relationship. This means that it is unclear whether attachment security can lead to an increase in self compassion, such as through secure internal working models which promote compassion towards the self, or whether high levels of self compassion may lead to the development of positive attachment relationships. It is also worthwhile highlighting that the study by Neff & McGehee (2010) is cross-sectional in nature. More longitudinal studies have demonstrated that attachment stability during adolescence may be lower than in adulthood, and the stability of attachment during this developmental period can be impacted by other factors such as parental separation or family conflict (e.g. Jones et al., 2018). This difficulty in establishing attachment representations during adolescence

presents a challenge for researchers, as it may be more difficult to fully explore how attachment relates to self compassion at this important developmental stage. This means that this could present a challenge to understanding the development of self compassion and how this may or may not be influenced by parent factors, such as parental stress or parental levels of self compassion.

However, it is important to recognise that the research in the area of self compassion has faced criticism due to the use of the measure of self compassion, the SCS (SCS; Neff, 2003b). While this measure has been separated in to six individual subscales, each aiming to tap into some of the theoretically conceptualised components of self compassion, it also produces an overall total score. Despite this, critics have posited that a vast number of studies only report on the overall total score, rather than looking at the individual subscale scores in their analysis (Muris & Otgaar, 2020). Muris and Otgaar (2020) point out that there are some subtle differences between some items on the subscale and how they relate to other constructs (e.g. symptoms of psychopathology), and that the use of only the overall total score presents a risk of missing these important differences. Some studies have also used a two factor solution, where scores on the SCS have been split into two categories (negative and positive dimensions) as opposed to using the overall total scores or individual subscale scores (e.g. Bohadana et al., 2019). This two dimensional categorisation combines self kindness, common humanity, and mindfulness to create the positive dimension of self compassion, and combines isolation, overidentification, and self judgement to create the negative dimension of self compassion. Therefore, this is troublesome for the field in general as it may be the case that the way in which the SCS is being used may lead to some important relationships and associations being overlooked. If this is the case and more nuanced differences are being missed, self compassion as a construct could be conflated with other psychological constructs thus presenting a conceptual and methodological issue in the research.

However, Neff et al. (2019), attempted to address this issue on a statistical level by exploring the factor structure of the SCS. They found that each item in the SCS loaded onto a broad factor of self compassion along with a factor which related to its specific subscale factor. According to Neff et al. (2019), this provided support for the use of both individual subscale scores and an overall total score. However, this analysis did not provide a good fit for a single factor solution (i.e. one single self compassion score only). Therefore, it could be argued that the use of only SCS total score is not supported on either a statistical or conceptual level. It is also important to recognise that

independent validation of the SCS measure is required, as beyond the paper by Neff et al. (2019), noting that Neff is the author of the SCS measure, there does not appear to be any further validation.

As the research above has demonstrated, self compassion may be an adaptive way of coping with stress and has been associated with positive wellbeing. It is important to understand how self compassion relates to parenting stress due to the possible negative outcomes of parenting stress, and the potential impact that this may have on the parent/carer and child relationship. Thus, being able to have a clearer understanding of the association between self compassion and parental stress could provide a clearer foundation for further exploring how parental and child factors interact. The potential differences in self compassion and parenting stress is worth exploring across different groups of parents, as previous findings may indicate that some parental sub-populations may be more likely to experience higher levels of parental stress than others. Experiencing higher levels of parental stress could also then be related to how well an individual is able to cope with and respond to this stress (i.e. through self compassion). However, as much of the research relies upon cross sectional study designs, the specific way in which self compassion relates to parenting stress and the extent to which these two concepts are related remains unclear. Therefore, the aim of the current review is to systematically explore the association between self compassion and parenting stress.

Research questions/hypotheses: -

1. What is the association between self compassion and stress in parents? It is hypothesised that greater levels of self compassion in parents will be related to lower levels of stress in parents.
2. Are there any differences in the associations between self compassion and stress in different subpopulations of parents (e.g. parents of children with ASD compared with parents of neurotypical children)? It is hypothesised that there will be significant differences in the association between self compassion and stress across different parental populations.
3. What is the association between self compassion and stress in parents over time? It is hypothesised that the association between self compassion and stress in parents will change over time, due to the findings in previous

research which suggest that parental stress levels differ across the different ages/developmental stages of the children.

Methodology

Search Strategy

This review aimed to explore the association between parent/caregiver stress and parent/caregiver self-compassion (see Appendix B for Prospero protocol - this protocol was developed but was not published on the Prospero website). In order to achieve this aim, a systematic search of ASSIA, MEDLINE, EMBASE, PsychINFO, and Web of Science was carried out. The search terms used in this review were ((parent* stress) OR (maternal stress) OR (care* stress) OR (paternal stress) OR (parent* hassle*) OR (care* hassle*) OR (parent* strain) OR (care* strain)) AND ((compassion*) OR (kind*)). There was no limitation applied to publication date. Studies were screened at the title level, and then relevant studies were screened at the abstract/full text level. Both peer review publications and "grey" literature were explored. Studies were initially screened at the title/abstract level following the removal of duplicates. Studies that were not considered to be relevant at the title/abstract level were discarded, and studies potentially eligible for inclusion in the review were reviewed at full text level.

Inclusion Criteria

Studies were considered to be eligible for inclusion if they included a sample of parents/caregivers. For the purposes of this review, a parent/caregiver sample was defined as those who parent/care for children/young people with a mean age under 18 years old. For inclusion in this review, studies had to have a measure of parent/caregiver stress (for example, a specific measure of parenting stress or a broader measure of stress) and use the SCS to measure self compassion. Due to the broad nature of psychological stress as a construct, studies which used a broad measure of psychological stress were be included, provided they also used the SCS. In other words, measures which provided a subscale score for stress alongside other symptoms were included. Initial scoping of studies revealed that the SCS was widely the dominant measure of self compassion across the observational studies. Although other

measures of self compassion exist (e.g. Fears of Compassion Scales; Gilbert et al., 2011), these appear to be more widely used in intervention research whereas the SCS is the dominant measure within cross-sectional and observational studies. If a study used a measure for which one subscale score is used to measure stress, these studies were included in the sample. The data were also required to be of sufficient detail to allow for associations between parent/caregiver stress and self-compassion to be calculated. Study designs considered eligible for inclusion in this review were quantitative and cross-sectional, longitudinal or retrospective.

Exclusion Criteria

Studies were excluded from this review if they did not have a measure of parent/carer self compassion or stress. Studies which had a sample of parent/carers of children with a mean age >18 were also excluded from the review. If no overall score for the measure of parent/caregiver stress or self compassion was reported (i.e. only individual subscale scores reported) then these studies were excluded. Studies which were not published in English or did not have an English language translation available were excluded from the review.

Quality Assessment

All articles which were considered to be relevant for inclusion after being reviewed at the full text stage were assessed for risk of bias and quality. Data were extracted and the National Institute of Health Quality Assessment tool for Observational Cohort and Cross Sectional Studies (National Institute of Health, 2013; see Appendix C) was used. This consisted of fourteen sections against which each study was rated for quality/risk of bias, and then given an overall rating of good, fair or poor. To further reduce risk of bias in the review, 50% of the studies included in the review were also assessed for risk of bias/quality by a second independent researcher. Any disagreements about the quality assessment were resolved through discussion.

Analytic strategy

Studies were synthesised narratively in the first instance, to demonstrate what the studies have reported with regards to the association between self compassion and stress in parents. Where appropriate uniformity existed across studies (i.e. a correlation coefficient had been reported on the association of the total scores on a measure of stress and the SCS total score in a parent population), the correlation coefficients demonstrating the association between self compassion and stress in parents were pooled and transformed using the Fisher's Z transformation. As there were only two longitudinal studies included in this review, these were not included in the overall pooled correlation coefficient analysis.

Results

Literature search

The literature search and exclusion procedure for the current study are demonstrated in Figure 1. Based on the inclusion and exclusion criteria, a total of 15 studies were deemed eligible for inclusion in the review.

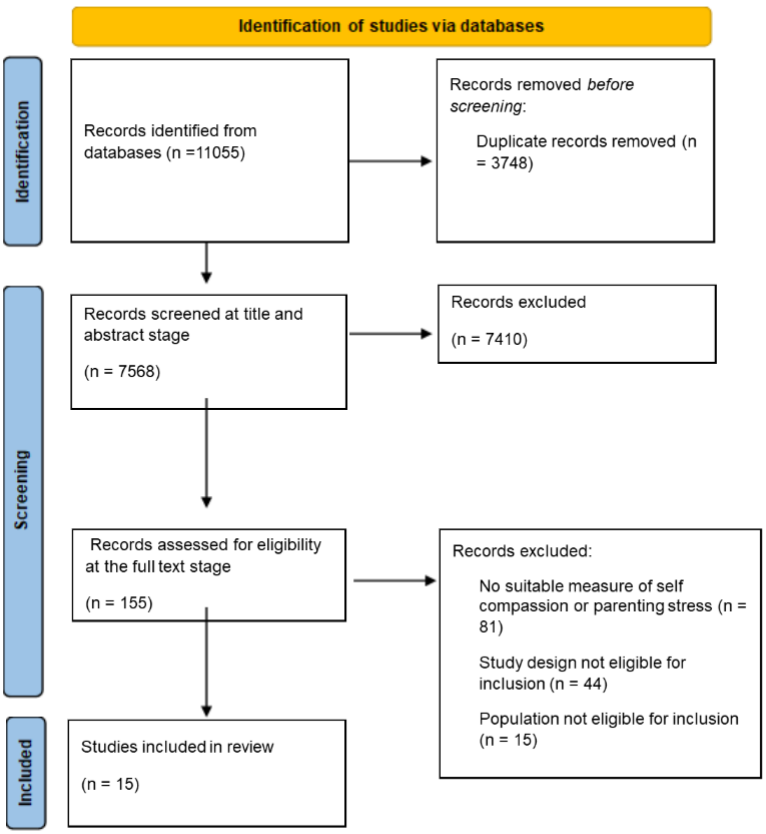

Figure 1 – a flow chart showing the process of the review and screening of studies for eligibility for inclusion against inclusion/exclusion criteria

Study and participant characteristics

A summary of the included studies can be seen in Table 1 below. In terms of study design, 13 studies were cross sectional and two studies utilised a longitudinal design. There were 11 studies which recruited their sample online/through social media, with seven of these studies also recruiting from schools/clinics/organisations as well as using online platforms. There were three studies which recruited only from schools, and one study recruited exclusively from clinic patients. There were three studies conducted in the United States, three studies carried out in Australia, two in the UK, two in Portugal, two in China, one in Poland, one in India, and one reported various countries where their study recruited participants. There was a range of different parent populations included in the

review. There were six studies which included a sample of parents of children with ASD. Of these six studies, one also included samples of parents of children with other diagnoses (e.g. ADHD, Tics/Tourette's Syndrome) and another one also included parents of children with Type 1 diabetes, and parents of neurotypical children without a chronic illness. There was one study which included a sample of caregivers of children with FASD, and another study which included a sample of mothers of a child with a diagnosis of cancer. There was also one study which included a sample of mothers who had experience of breastfeeding within the last 10 years.

Table 1 – A summary of the studies included in the review

Study	**Study design**	**Population description**	**Method of recruitment**	**Total no. of participants**	**Measure used Self compassion**	**Measure used Parenting stress**	**Summary of results – r values for the association between self compassion and stress**
Lee (2013)	Cross sectional	Parents of children with ASDs, Type 1 Diabetes, and neurotypical children without a chronic-illness	parent groups, online	409	SCS Total score	PSI Total score	r = .38** for parents of children with ASD
Neff & Faso (2015)	Cross sectional	Parent of a child with ASD between the ages of 4 and 12	Email	51	SCS Total score	PSI-SF	r=-0.66**

Gouveia et al. (2016)	Cross sectional	Parents of school-aged children and adolescents	schools	333	SCS total score	PSI-SF parenting distress subscale only	r=-0.57**
Edwards (2018)	Cross sectional	Mothers of school-aged children	online, social media	165	SCS-SF Total Score	PSS Total score	r= -0.45**
Torbet et al. (2019)	Cross sectional	Parent of a child (18 years or younger) with ASD	Organisations, online and social media	237	SCS Total score	K10 Total score	r=-0.67**
Biddle et al. (2020)	Cross sectional	Caregivers of children, adolescents and young adults diagnosed with FASD, aged from 0 to 25 years	Online through organisations	175	SCS-SF Total Score	DASS Total Score	r=-0.66**

Mazumdar et al. (2021)	Cross sectional	Mothers with children 10 years and younger	Social media	242	SCS-SF Total score	PSS total score	r=-0.049**
Wang et al. (2022)	longitudinal	Parents of children aged 6-11 years	schools	322	SCS-SF Total score	PSI-SF Total score	T1 r= -0.40 T2 r=-0.32 T3 r=-0.39
Moreira et al. (2015)	Cross sectional	Mothers of children aged 8-18 years	schools	171	SCS Total score	PSI-SF parental distress subscale only	r=-0.61**
Chan et al. (2020)	Cross sectional	Caregivers of children with ASD	schools and online	121	SCS-SF total score	DASS21 stress subscale	r=−0.49**
Clapp (2018)	Cross sectional	Parents of children with ASD, ADHD, Tics/Tourette's Syndrome	clinic and online	82	SCS Total score	PSS Total Score	r-.36**
Cassidy & McLaughlin (2021)	Cross sectional	Mothers who were the primary caregiver for a	Clinic patients	255	SCS Total Score	GHQ Total Score	r= −0.48**

		child with a diagnosis of cancer					
Mahurin-Smith & Beck (2021)	Cross sectional	Mothers with breastfeeding experience in last 10 years	social media	316	SCS total score	PSS total score	r= −0.63**
Pyszkowska et al. (2021)	Cross sectional	Parents of children with ASD	schools, online	233	SCS-SF total score	DASS 3 separate subscales	r= −0.52**
Fernandes et al. (2021)	Longitudinal	Mothers of infants aged between 0 and 12 months	Online, social media	125	SCS-SF Total score	PSS Total score	T1 r=-0.61** T2 r= -0.62**

Note:

ASD = Autism Spectrum Disorder, ADHD = Attention Deficit and Hyperactivity Disorder, and FASD = Fetal Alcohol Spectrum Disorder

SCS = self compassion scale, SCS-SF = self compassion scale short form, PSI = parenting stress index, PSI-SF = parenting stress index short form, K10 = Kessler Psychological Distress Scale, PSS = parental stress scale, DASS = Depression and Anxiety Scale, GHQ = General Health Questionnaire, QRS-F = Questionnaire on Resources and Stress Scale.

** $p<0.001$

Measurement

Self compassion

All studies in the current review used a version of the Self Compassion Scale (SCS; Neff, 2003b) to measure self compassion. There were eight studies used the full SCS, whereas seven studies used the short version of this measure (SCS-SF; Raes et al, 2011). There were 15 studies which reported the total overall score for self compassion.

Parenting stress

There was some variation in the measures of parenting stress used across studies in the current review. Measures included the Parenting Stress Index (PSI; Abidin, 1995, n=1), or its short form (PSI –SF; Abidin, 1995, n=4), Parental Stress Scale (PSS; Berry & Jones, 1995, n=5), the Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995, n=3), the Kessler Psychological Distress Scale (K10; Kessler et al., 2002, n=1) and the General Health Questionnaire (GHQ; Goldberg, 1972, n=1).

Quality Assessment

Quality assessment revealed that seven studies were of good quality, seven were of fair quality and only one was deemed to be of poor quality (see Appendix D for full quality assessment table). The two studies which employed a longitudinal study design were rated as being of good quality. Less than half of the studies included in the review were deemed to be of good quality. This is problematic as, due to the limited research in this area, there appears to be concerns regarding the quality of the studies. The studies which provided sample size justification and power description tended to be rated as being of good quality, and therefore there may be some issues with statistical power in some of the poorer quality studies, thus suggesting results may need to be interpreted with caution. Nonetheless, it is important to acknowledge the developing nature of this field of research and that perhaps over time, study quality in this area will improve. This review has demonstrated that those studies which were longitudinal were rated at the

highest level of quality. This highlights the importance of not relying solely on studies with a cross-sectional design as this may impact the overall quality of the evidence base, as being longitudinal in design appears to be a strength in terms of study quality. Although cross sectional studies do help highlight the association between variables, the lack of more longitudinal research in this area means it is difficult to draw conclusions about how the association between self compassion and stress develop over time.

Narrative synthesis of results

Summary

Overall, the majority of the studies included in this review demonstrated a statistically significant association between self compassion and stress in parent populations. Amongst the cross sectional studies which reported total scores for self compassion and stress, 12 studies reported a statistically significant negative association between self compassion and stress. The two longitudinal studies also demonstrated significant associations with self compassion and parental stress over time.

Parents of children with ASD

There were six studies which explored the association between self compassion and stress in parents of children with ASD, all of which used a cross sectional design. Of these six studies, five reported a statistically significant relationship between high levels of parental self compassion and low levels of stress. The remaining study interestingly found that high levels of self compassion was significantly associated with high levels of parental stress in parents of children with ASD. It is worth noting, however, that this study was rated as being of poor quality at the quality assessment stage in the review. Therefore, the studies which demonstrated a significant association between high self compassion and low parenting stress were considered to be of higher quality, thus their findings may be considered with a higher regard.

Meta analysis

Meta analyses of the association between parenting stress and self compassion were carried out on the 13 studies which reported one overall score for parenting stress and self compassion. The overall size of the samples combined was n = 2760. The pooled correlation coefficient for the association between parenting stress and self compassion, after being transformed using Fisher's Z transformation and then transformed back to r value, was r = -0.42, (95%CI = -0.45 to -0.38). In line with Cohen's (1992) categorisations for correlation coefficient effect sizes, this meta analysis demonstrated a medium effect size for the association between lower parenting stress and higher self compassion across the 13 studies included in the analysis.

Discussion

The aim of the current review was to systematically review the relationship between parenting stress and self compassion. The review revealed 15 studies which were eligible for inclusion in the review. The majority of the studies demonstrated a statistically significant association between self compassion and stress in different parent populations. The meta analyses of the 13 studies which reported one overall total score for the association between parenting stress and self compassion revealed a medium effect size. Therefore, parents who reported higher levels of self compassion also reported experiencing lower levels of stress, which could indicate that having higher self compassion means that lower stress levels are experienced. This could be considered as support for the view that when individuals are faced with stress, self compassion is a helpful way of coping (Allen & Leary, 2010; Ewert et al., 2021).

An interesting detail the current review has revealed is that six of the 15 studies included in the current review were conducted within populations including parents of children with a diagnosis of ASD. This is of particular note as it has been suggested in other studies that parents of children with ASD may experience higher levels of stress than parents of children without ASD (e.g. Keenan et al., 2016, Hayes & Watson, 2013). However, this review did not appear to highlight any particular differences in the association between self compassion and stress in parents of children with ASD compared to parents of typically developing children. Therefore, although it may be the case that parents of children with ASD experience higher levels of stress than parents of typically developing children as suggested by previous research, it may not impact the relationship between their levels of stress and self

compassion. However, it is difficult to fully consider and explore how the specific challenges of different parental populations impact the association between stress and self compassion, as the majority of the research either focuses on general parental populations or parents of children with ASD.

One key criticism of the studies included in this review is the use of the total score on the Self Compassion Scale. As this was an inclusion criteria, all studies in this review used a version of this measure as it was hoped that this would allow for some homogeneity across studies thus allowing for meta analyses. However, the use of the measure varied across studies. For example, some studies used the whole scale, whereas others used the short form (see Table 1). Similarly, the majority of studies only reported the total score in their analyses, while others made use of some/all of the subscale scores, or split the scale into two dimensions (positive/negative self compassion). This is problematic as there has been a great deal of criticism on the use of the SCS total score. Muris and Otgaar (2020) stated that the use of an overall total score is troublesome as it appears that not all subscales relate to different wellbeing constructs in the same way. Thus, the use of one overall score might lead to some important, perhaps smaller, differences between the association of self compassion and other constructs, being missed. It is also worth noting that the use of one overall total score in 13 of the studies included in the review allowed for the reported correlation coefficients to be pooled and meta analysed in the current review. Therefore, it appears that there is a great level of heterogeneity across studies in this area of research in terms of how they have used this measure, and this has meant that it has been difficult to pool all results together in a meta analysis. This review has highlighted that although one measure of self compassion does appear dominant in the field at present, the way in which this is used across studies varies and therefore means it is difficult to generalise findings across studies. It is also important to note that this meta analysis only revealed a medium effect size for the association between parental stress and self compassion. Therefore, it could be argued that the use of one total score does not provide an insight into how each individual component of self compassion may relate to stress in parents, which may be of particular importance when considering possible areas for intervention. Similarly, it may be the case that there are other related constructs which may be influencing the association between self compassion and stress in parents, however this is beyond the scope of the current review.

Although the results of the meta analysis may provide some support for the model proposed by Lathren et al. (2020) in that parenting stress and self compassion do appear to be associated with each other, the effect size of this association was found to be medium. Therefore, it could be the case that investigation of other variables is important, to fully understand how self compassion develops during parenthood, which may provide a clearer insight into the mechanisms by which this relates to child outcomes. This would allow for a greater exploration of the mechanisms highlighted in the Lathren et al. (2020) model.

Another criticism of the research which explored the association between self compassion and parenting stress is the heterogeneity of the measures of stress. Some studies used a specific parenting stress measure (Fernandes et al., 2021; Mahurin-Smith & Beck, 2021; Clapp, 2018; Moreira et al., 2015; Wang et al., 2022; Mazumdar et al., 2021; Edwards, 2018; Gouveia et al., 2016; Neff & Faso; 2015; and Lee, 2013), whereas others used a more generic measure of stress but within a parent population. Even within studies which utilised the same measure of parental stress, there was some variation in how these findings were reported. For example, Lee (2013) used the PSI full measure whereas many other opted to sue the shorter version (PSI-SF; Gouveia et al., 2016; Neff & Faso; 2015; Moreira et al., 2015; and Wang et al., 2022). This variation in measurement and reporting of results presents difficulties in drawing generalisable conclusions, however it does allow for a variety of different conceptualisations of parenting stress to be explored within the research. Despite this, the majority of studies did report a significant association between self compassion and their measure of stress in parent populations. However, it is important to recognise that the majority of studies included in this review were cross sectional in nature. Therefore, while highlighting the association between self compassion and parenting stress, the causal direction of these associations remains unclear. One could argue that high levels of self compassion enable an individual to be better able to cope with stress they encounter in life. Alternatively, it could also be argued that being exposed to high levels of stress may reduce an individual's capacity for self compassion. Therefore, although this review shines a light on the association between these two concepts, it is important to note that further research could help to provide more clarity on how these concepts interact.

The quality assessment of the studies included in this review revealed that less than half of the studies were rated as being of good quality. As the main weakness in lower quality studies was sample size, this suggests that the overall metanalysis findings could be at risk of overinflating the association between self compassion and stress in parent populations. Therefore, it is clear that further, high quality research would help provide a clearer insight into the true extent and nature of this association.

Limitations of the current review

One limitation of the current review is that, although it explores the association between self compassion and stress in parents, it does not go further to identify the mechanisms through which these two variables are associated. Although this was not the specific aim of the current review, it would undoubtedly be worthwhile to explore further possible mediating or moderating factors within this association. Greater exploration of the longitudinal associations between self compassion and parenting stress, along with other related psychological concepts, may help shed further light on how self compassion and parenting stress develop over time. Therefore, future research may wish to consider the mechanisms by which self compassion is related to stress in parent populations. For example, research exploring the role of attachment in the relationship between stress and self compassion in parents would allow further exploration of the underlying mechanisms for how these concepts develop. This review did also not provide statistical heterogeneity, and this would perhaps be beneficial for future reviews to include. Similarly, this review only included studies which used the SCS measure of self compassion, which is composed of six subscales (self kindness, self judgement, common humanity, isolation, mindfulness, and overidentification). This is problematic as it does not allow a great deal of space for different conceptualisations or measures of this concept to be explored which in turn, does not allow for a contribution in the development of the understanding of what self compassion is and how it relates to different psychological concepts. Kagan et al. (2002) suggest that having only one measure of a construct means that individuals are categorised into one homogeneous group and this may overlook individual differences that exist, and that measuring constructs from different sources allows for more subtle differences across individuals to be revealed. Future research may also aim to explore the association between parental stress and self compassion and child outcomes, such as child self compassion, as this may test the validity of the model proposed by Lathren et al. (2020). Only two studies included in this review were longitudinal in design, however they were

deemed to be of good quality. This review did not conduct meta analyses on some of the parental subpopulations, such as mothers or fathers exclusively, or groups of parents of younger children compared with parents of adolescents. Some of the data from subpopulations were difficult to clearly identify within studies and thus there were insufficient clear data to conduct these analyses, however it would be interesting to consider this in future reviews. In order to do this, it would be helpful for future studies to ensure separate subpopulation data are clearly separated in the analysis section.

Implications for practice

As this review conveyed the association between self compassion and parenting stress, there are some important implications for practice. For example, it is important to consider how specific groups experience stress during parenting and how this may be related to their coping. When considering interventions for parents which include self compassion, it is worthwhile exploring parental stress levels and how this may or may not impact on the pre and post intervention outcomes. As high levels of self compassion and low levels of stress have been linked to various positive wellbeing indicators, it is essential to consider these concepts in a clinical context as this may help provide some understanding of where specific difficulties are and how this impacts overall coping.

Conclusions

This current review explored the association between self compassion and stress in parent populations. Meta analysis revealed a medium effect size for this association, with higher levels of self compassion being related to lower levels of stress. This review also demonstrated the challenges associated with the current conceptualisations of self compassion and how this is measured in the research. Nonetheless, this review highlighted the need for further exploration of how self compassion relates to stress as this may help inform future intervention research.

References

Abidin, R. R. (1995). *Parenting Stress Index: Professional Manual;[PSI]*. PAR, Psychological Assessment Resources.

Allen, A. B., & Leary, M. R. (2010). Self-Compassion, stress, and coping. *Social and personality psychology compass*, *4*(2), 107-118.

Anderson, L. S. (2008). Predictors of parenting stress in a diverse sample of parents of early adolescents in high-risk communities. *Nursing research*, *57*(5), 340.

Aspinwall, L. G., & Taylor, S. E. (1997). A stitch in time: self-regulation and proactive coping. Psychological bulletin, 121(3), 417.

Barroso, N. E., Mendez, L., Graziano, P. A., & Bagner, D. M. (2018). Parenting stress through the lens of different clinical groups: A systematic review & meta-analysis. *Journal of abnormal child psychology*, *46*, 449-461.

Berry, J. O., & Jones, W. H. (1995). The parental stress scale: Initial psychometric evidence. *Journal of social and personal relationships*, *12*(3), 463-472.

Biddle, Z., O'Callaghan, F. V., Finlay-Jones, A. L., & Reid, N. E. (2020). Caregivers of children with fetal alcohol spectrum disorder: Psychosocial factors and evidence for self-compassion as a potential intervention target. *Mindfulness*, *11*, 2189-2198.

Bohadana, G., Morrissey, S., & Paynter, J. (2019). Self-compassion: A novel predictor of stress and quality of life in parents of children with autism spectrum disorder. *Journal of autism and developmental disorders*, *49*, 4039-4052.

Bui, T. H. T., Nguyen, T. N. T., Pham, H. D., Tran, C. T., & Ha, T. H. (2021). The mediating role of self-compassion between proactive coping and perceived stress among students. *Science Progress*, *104*(2), 00368504211011872.

Cassidy, T., & McLaughlin, M. (2021). Caring for a child with cancer: The role of attachment, self-compassion and social support. *Child Care in Practice*, 1-13.

Chan, B. S. M., Deng, J., Li, Y., Li, T., Shen, Y., Wang, Y., & Yi, L. (2020). The role of self-compassion in the relationship between post-traumatic growth and psychological distress in caregivers of children with autism. *Journal of Child and Family Studies*, *29*, 1692-1700.

Clapp, M. (2018). Mindfulness, Self-Compassion, Parental Stress, Well-Being and Child Behaviour in Neurodisability.

Cohen, J. (1992). Statistical power analysis. *Current directions in psychological science*, *1*(3), 98-101.

Constantakes, A. K. (2021). *Self-Compassion in Parents of Children with Autism Spectrum Disorders: A Mediation Study*. Xavier University.

Edwards, C. (2017). *Parental attachment and child adjustment: The role of parenting stress and self-compassion*. Ball State University.

Ewert, C., Vater, A., & Schröder-Abé, M. (2021). Self-compassion and coping: A meta-analysis. *Mindfulness*, *12*, 1063-1077.

Fernandes, D. V., Canavarro, M. C., & Moreira, H. (2021). The role of mothers' self-compassion on mother–infant bonding during the COVID-19 pandemic: a longitudinal study exploring the mediating role of mindful parenting and parenting stress in the postpartum period. *Infant Mental Health Journal*, *42*(5), 621-635.

Friedrich, W. N., Greenberg, M. T., & Crnic, K. (1983). The Revised Questionnaire on Resources and Stress: QRS-R. *American Journal of Mental Deficiency*, *88*, 41-48.

Gilbert, P. (2014). The origins and nature of compassion focused therapy. *British journal of clinical psychology*, *53*(1), 6-41.

Gilbert, P., McEwan, K., Matos, M., & Rivis, A. (2011). Fears of compassion: Development of three self-report measures. *Psychology and Psychotherapy: Theory, research and practice*, *84*(3), 239-255.

Goldberg, P. (1972). The detection of psychiatric illness by questionnaire. *Maudsley monograph*.

Gouveia, M. J., Carona, C., Canavarro, M. C., & Moreira, H. (2016). Self-compassion and dispositional mindfulness are associated with parenting styles and parenting stress: The mediating role of mindful parenting. *Mindfulness*, *7*, 700-712.

Hayes, S. A., & Watson, S. L. (2013). The impact of parenting stress: A meta-analysis of studies comparing the experience of parenting stress in parents of children with and without autism spectrum disorder. *Journal of autism and developmental disorders*, *43*, 629-642.

Jefferson, F. A., Shires, A., & McAloon, J. (2020). Parenting self-compassion: A systematic review and meta-analysis. *Mindfulness*, *11*, 2067-2088.

Jones, J. D., Fraley, R. C., Ehrlich, K. B., Stern, J. A., Lejuez, C. W., Shaver, P. R., & Cassidy, J. (2018). Stability of attachment style in adolescence: An empirical test of alternative developmental processes. *Child development*, *89*(3), 871-880.

Kagan, J., Snidman, N., McManis, M., Woodward, S., & Hardway, C. (2002). One measure, one meaning: Multiple measures, clearer meaning. *Development and Psychopathology*, *14*(3), 463-475.

Keenan, B. M., Newman, L. K., Gray, K. M., & Rinehart, N. J. (2016). Parents of children with ASD experience more psychological distress, parenting stress, and attachment-related anxiety. *Journal of autism and developmental disorders*, *46*, 2979-2991.

Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L., ... & Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological medicine*, *32*(6), 959-976.

Lathren, C., Bluth, K., & Zvara, B. (2020). Parent self-compassion and supportive responses to child difficult emotion: An intergenerational theoretical model rooted in attachment. *Journal of family theory & review*, *12*(3), 368-381.

Lathren, C. R., Rao, S. S., Park, J., & Bluth, K. (2021). Self-compassion and current close interpersonal relationships: A scoping literature review. *Mindfulness*, *12*, 1078-1093.

Lee, C. I. (2013). *Stress and self-compassion in parents of children with autism spectrum disorders* (Doctoral dissertation).

MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical psychology review*, *32*(6), 545-552.

Mahurin-Smith, J., & Beck, A. (2021). Caregivers' experiences of infant feeding problems: The role of self-compassion and stress management. *American Journal of Speech-Language Pathology*, *30*(4), 1856-1865.

Mazumdar, K., Sen, I., Gupta, P., & Parekh, S. (2021). Psychological well-being of Indian mothers during the COVID-19 pandemic. *International Perspectives in Psychology*.

Moreira, H., Gouveia, M. J., Carona, C., Silva, N., & Canavarro, M. C. (2015). Maternal attachment and children's quality of life: The mediating role of self-compassion and parenting stress. *Journal of Child and Family Studies*, *24*, 2332-2344.

Moreland, A. D., Felton, J. W., Hanson, R. F., Jackson, C., & Dumas, J. E. (2016). The relation between parenting stress, locus of control and child outcomes: Predictors of change in a parenting intervention. *Journal of Child and Family Studies*, *25*, 2046-2054.

Muris, P., & Otgaar, H. (2020). The process of science: A critical evaluation of more than 15 years of research on self-compassion with the Self-Compassion Scale. *Mindfulness*, *11*, 1469-1482.

NIH - National Heart, Lung, and Blood Institute. (2019). Study Quality Assessment Tools

Neff, K. (2003a). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and identity*, *2*(2), 85-101.

Neff, K. D. (2003b). The development and validation of a scale to measure self-compassion. *Self and identity*, *2*(3), 223-250.

Neff, K. D. (2011). Self-compassion, self-esteem, and well-being. *Social and personality psychology compass*, *5*(1), 1-12.

Neff, K. D., & Faso, D. J. (2015). Self-compassion and well-being in parents of children with autism. *Mindfulness*, *6*, 938-947.

Neff, K. D., & McGehee, P. (2010). Self-compassion and psychological resilience among adolescents and young adults. *Self and identity*, *9*(3), 225-240.

Neff, K. D., Rude, S. S., & Kirkpatrick, K. L. (2007). An examination of self-compassion in relation to positive psychological functioning and personality traits. *Journal of research in personality*, *41*(4), 908-916.

Neff, K. D., Tóth-Király, I., Yarnell, L. M., Arimitsu, K., Castilho, P., Ghorbani, N., ... & Mantzios, M. (2019). Examining the factor structure of the Self-Compassion Scale in 20 diverse samples: Support for use of a total score and six subscale scores. *Psychological assessment*, *31*(1), 27.

Paucsik, M., Nardelli, C., Bortolon, C., Shankland, R., Leys, C., & Baeyens, C. (2023). Self-compassion and emotion regulation: testing a mediation model. *Cognition and Emotion*, *37*(1), 49-61.

Preuss, H., Capito, K., van Eickels, R. L., Zemp, M., & Kolar, D. R. (2021). Cognitive reappraisal and self-compassion as emotion regulation strategies for parents during COVID-19: An online randomized controlled trial. *Internet interventions*, *24*, 100388.

Putnick, D. L., Bornstein, M. H., Hendricks, C., Painter, K. M., Suwalsky, J. T., & Collins, W. A. (2010). Stability, continuity, and similarity of parenting stress in European American mothers and fathers across their child's transition to adolescence. *Parenting: Science and practice*, *10*(1), 60-77.

Pyszkowska, A., Rożnawski, K., & Farny, Z. (2021). Self-stigma and cognitive fusion in parents of children with autism spectrum disorder. The moderating role of self-compassion. *PeerJ*, *9*, e12591.

Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2011). Construction and factorial validation of a short form of the self-compassion scale. *Clinical psychology & psychotherapy*, *18*(3), 250-255.

Stutts, L. A., Leary, M. R., Zeveney, A. S., & Hufnagle, A. S. (2018). A longitudinal analysis of the relationship between self-compassion and the psychological effects of perceived stress. *Self and Identity*, *17*(6), 609-626.

Torbet, S., Proeve, M., & Roberts, R. M. (2019). Self-compassion: a protective factor for parents of children with autism spectrum disorder. *Mindfulness*, *10*, 2492-2506.

Wang, D., Xie, R., Ding, W., Yuan, Z., Kayani, S., & Li, W. (2022). Bidirectional longitudinal relationships between parents' marital satisfaction, parenting stress, and self-compassion in China. *Family Process*, e12785.

Appendix A: - Author guidelines for Journal of Child and Family Studies

Please see link for further information regarding author guidelines:

Journal of Child and Family Studies | Submission guidelines (springer.com)

Appendix B – Prospero Protocol

Systematic Review Protocol

Review Title

Parent/caregiver stress and self compassion: A systematic review.

Anticipated/actual start date

04.07.2022

Anticipated completion date

30.12.2022

Stage of Review at time of submission

- Preliminary searches		Yes
- Piloting of the study selection process		Yes
- Formal screening of search results against eligibility criteria	Yes	
- Data extraction		No
- Risk of bias (quality) assessment		No
- Data analysis		No

Named Contact

Kelsey Boyle

Email address of named contact

Named contact address

University of Edinburgh

Organisational affiliation of the review

University of Edinburgh

Review team members and their organisational affiliations

Dr Emily Taylor, University of Edinburgh

Funding sources/sponsors

University of Edinburgh

Conflicts of interest

None known

Collaborators

None

Review questions

What is the association between parent/caregiver stress and parent/caregiver self-compassion?

Searches

The databases which will be used to search for literature will be ASSIA, MEDLINE, EMBASE, PsychINFO, and Web of Science. The following search terms will be used:

- ((parent* stress) OR (maternal stress) OR (care* stress) OR (paternal stress) OR (parent* hassle*) OR (care* hassle*) OR (parent* strain) OR (care* strain)) AND ((compassion*) OR (kind*))

There will be no limitation applied to publication date. Studies will be screened at the title level, and then relevant studies will be screened at the abstract/full text level. Both peer review publications and "grey" literature will be explored.

Condition or domain being studied

Parental/caregiver stress and self-compassion will be reviewed. Self-compassion refers to an individual's ability to show warmth and compassion towards themselves at times of suffering.

Participants/population

Studies will be eligible for inclusion if they include a sample of parents/caregivers - for the purposes of this review, the mean age of the children/young people whom parents/caregivers care for and parent will be <18 years old.

Intervention/exposure

For inclusion in this review, studies will have to have a measure of parent/caregiver stress (this may be a specific measure of parenting stress or a more broad measure of stress) and a measure of parent/caregiver self-compassion (namely the Self Compassion Scale). The studies which are eligible for inclusion in this review will include an overall measure of both stress and self-compassion, rather than including only individual subscale data. The data must also be of sufficient detail to allow for associations between parent/caregiver stress and self-compassion to be calculated.

Comparator/Control

N/A

Types of studies to be included

To be included in the systematic review, they will be quantitative and of a cross-sectional, longitudinal or retrospective design.

Context

Studies that explore the association between parent/caregiver stress and self-compassion.

Main outcomes

For inclusion in this review, studies will have to have a measure of parent/caregiver stress (this may be a specific measure of parenting stress or a more broad measure of stress) and a measure of parent/caregiver self-compassion (the Self Compassion Scale). The studies which are eligible for inclusion in this review will include an overall measure of both stress and self-compassion, rather than including only individual subscale data. The data must also be of sufficient detail to allow for associations between parent/caregiver stress and self-compassion to be calculated.

Measures of effect

N/A

Data extraction

Studies identified at the initial search stage will be stored using Covidence. Studies will initially be screened for eligibility at the title level, and then studies which are deemed eligible for further screening will be screened at the abstract and then full text level. Studies will be screened against the eligibility criteria. The main researcher and an independent researcher will screen the studies, and any discrepancies will be discussed.

Risk of bias assessment

The AXIS risk of bias tool will be used for this review. Risk of bias will be assessed by the main researcher and an independent researcher, and any discrepancies will be discussed.

Strategy for data synthesis

A narrative synthesis of the data findings will be produced. Depending on whether there is a homogeneity of data/measures used in the studies, a meta-analysis of the association between parent/caregiver stress and self-compassion within study findings may be produced.

Analysis of subgroups or subsets

N/A

Type and method of review

Systematic Review

Mental health and behavioural conditions

Language

English

Country

Scotland

Dissemination plans

Submission as part of DClinPsychol thesis

Keywords

Self compassion, parenting stress, systematic review

Current Review Status

Ongoing

Any additional information

N/A

Appendix C – Quality appraisal tool

Please follow the below link for full details of the Quality appraisal tool:

Study Quality Assessment Tools | NHLBI, NIH

Appendix D – Quality Appraisal Table

Study	Was the research question or objective in this paper clearly stated?	Was the study population clearly specified and defined?	Was the participation rate of eligible persons at least 50%?	Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?	Was a sample size justification, power description, or variance and effect estimates provided?	For the analyses in this paper, were the exposure(s) of interest measured prior to the outcome(s) being measured?	Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed?	For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g., categories of exposure, or exposure measured as continuous variable)?	Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?	Was the exposure(s) assessed more than once over time?	Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?	Were the outcome assessors blinded to the exposure status of participants?	Was loss to follow-up after baseline 20% or less?	Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?	Overall Quality Rating
Biddle et al 2020	Y	Y	NR	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Fair
Cassidy et al 2021	Y	Y	NR	N	N	N	N	Y	Y	N	Y	NA	NA	Y	Fair
Chan et al 2020	Y	Y	NR	N	N	N	N	Y	Y	N	Y	NA	NA	Y	Fair
Clapp et al 2019	Y	Y	NR	N	Y	N	N	Y	Y	N	Y	NA	NA	Y	Fair

Edwards 2018	Y	Y	NR	Y	Y	N	N	Y	Y	N	Y	NA	NA	Y	Good
Fernandes et al 2022	Y	Y	NR	Y	Y	N	Y	Y	Y	Y	Y	NA	N	Y	Good
Gouveia et al 2016	Y	Y	NR	Y	Y	N	N	Y	Y	N	Y	NA	NA	Y	Good
Lee 2014	Y	Y	NR	N	N	N	N	Y	Y	N	Y	NA	NA	Y	Poor
Mahurin Smith et al 2021	Y	Y	NR	Y	Y	N	N	Y	Y	N	Y	NA	NA	Y	Good
Mazumdar 2021	Y	Y	NR	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Fair
Moreira et al 2015	Y	Y	NR	Y	Y	N	N	Y	Y	N	Y	NA	NA	Y	Good
Neff et al 2015	Y	Y	NR	Y	N	N	N	Y	Y	N	Y	NA	NA	Y	Good
Pyszkowska et al 2021	Y	Y	NR	N	Y	N	N	Y	Y	N	Y	NA	NA	Y	Fair
Torbet et al 2019	Y	Y	NR	N	Y	N	N	Y	Y	N	Y	NA	NA	Y	Fair
Wang 2022	Y	Y	NR	Y	Y	N	N	Y	Y	Y	Y	NA	NA	Y	Good

Chapter 2 – Bridging Chapter

As can be seen from the current review, there have been some conceptual issues raised with the construct of self-compassion. Firstly, one such issue is in relation to the measurement of self compassion and how the use of these measures has been used across the research in this field. The variation in how these measures are used (i.e. use of the full scale score versus individual subscale scores) makes it difficult to generalise the findings more broadly. Furthermore, the lack of a broad range of measures of self compassion present a challenge to the rigor of how self compassion has been conceptualised, as it may be that important aspects of this psychological construct are being overlooked in the research (Muris & Otgaar, 2020). It has been suggested that self compassion is considered as an adaptive way of coping with stress (Allen & Leary, 2010). Similarly, the construct of emotion regulation has been considered to be a way of conceptualising how individuals regulate in response to events which they may perceive as challenging (McRae & Gross, 2020). The distinction between self compassion as an individual concept versus being considered a wider component of emotional regulation has also been an area of discussion within the field. For example, many studies have demonstrated an association between self compassion and emotion regulation (Inwood & Ferrari, 2018; Paucsik et al., 2022). The relationships between the two components could be argued to be indicative of some level of conceptual overlap. Self compassion and emotion regulation have been linked together conceptually in research as they could both be considered as psychological constructs which strengthen positive emotions and lessen negative emotional experiences (Bates et al., 2020). Self compassion has been shown to be related psychopathology (MacBeth & Gumley, 2012), as has emotion regulation (Sloan et al., 2017). Therefore, as self compassion and emotion regulation appear to be related to each other, and they are both considered to be important predictors of psychopathology, research has begun to explore the ways in which these psychological constructs are understood together.

There have been some explorations of how self compassion and emotional regulation are related, and how these constructs are related to psychopathology. Conceptualising psychopathology within a developmental framework suggests that psychopathology develops across time, through a complex interplay of different interactions, environmental factors and pathways (Sroufe, 2019). Understanding psychopathology within this framework allows for an exploration of different potential influences across development, such as emotion regulation or self

compassion. For example, the authors of a recent systematic review of the association between self compassion, emotion regulation and psychopathology suggested that mechanism of change in the association between self compassion and psychopathology is emotion regulation (Inwood & Ferrari, 2018). Therefore, it may be the case that self compassion may be related to psychopathology by facilitating effective emotional regulation. Similarly, some research has suggested that self compassion was effective in improving mood in adults with Major Depressive Disorder (MDD), and that there were no differences in the effectiveness of self compassion compared with the emotion regulation strategies of reappraisal and acceptance in improving mood in this sample (Deidrich et al., 2014). However, it is worth noting that study did not investigate other emotion regulation strategies so it is unclear whether self compassion would demonstrate similar effectiveness in improving mood compared to other emotion regulation strategies. The view that self compassion may not be related to all aspects of emotion regulation is supported by a recent review by Paucsik et al. (2022) who found that self compassion did not predict the use of some emotion regulation strategies, such as distraction, emotional expression, social support, and consumption strategies. Another important point to note is that it could be the case that some aspects of emotion regulation are not independent constructs. Wolgast et al. (2012) stated that acceptance and cognitive restructuring are overlapping constructs as they found similarities in the underlying factors across both constructs, such as "active acceptance". It could be argued that this underlying factor may relate to the conceptualisation of self compassion, particularly the aspect of mindfulness highlighted as a key component by Neff (2003a), as this refers to not over identifying with difficult thoughts/feelings. This suggests that that some components of emotion regulation have a conceptual overlap, and this may also be the case for self compassion.

Appraisal of stimuli is also thought to be important in the conceptualisation of self compassion within an emotion regulation framework. Within emotion regulation research, appraisal refers to how an individual interprets and makes sense of events, and that it is this which influences emotional experiences, rather than the event itself. Thus, two different individuals may interpret and appraise the same situation in different ways. It could be argued that if an individual is high in self compassion, they may be less likely to interpret a neutral or negative stimuli in a negative manner, or may be better able to reappraisal these stimuli in a more adaptive way even if they experience an initial emotional response which is negative (Finlay-Jones, 2017). Therefore, it may be the case that self compassion can be understood within an emotion regulation framework in terms of how an individual appraises situations and utilises emotional regulation strategies, as well as having an impact on emotional reactivity (Finlay-

Jones, 2017). Unlike self compassion, the research within the field of emotion regulation appears to be well established and there exist different conceptualisations of this construct, with a wide range of methods of measuring and assessing emotion regulation which is used within research (Gross, 2015). Therefore, although there may be some disagreement within the field as to exactly how self compassion relates to all aspects of emotion regulation, there does appear to be a theoretical and methodological rationale for understanding self compassion within an emotion regulation framework.

The development of self compassion and how this relates to emotion regulation has also been an area of interest within the research. Within this area of research, attachment security is thought to be an important construct, with previous research demonstrating the positive association between attachment security and self compassion (Lathren et al., 2021; Neff & McGehee, 2010). It has been suggested that having secure, warm and attuned interactions with caregivers enables individuals to internalise this internal working model for relationships, which then in turn enables the internalisation of a positive, compassionate perspective of the self (Lathren et al., 2020). Conversely, having inconsistent or abusive interactions with caregivers can lead to the development of an insecure internal working model of relationships, which then in turn can be internalised in to negative, critical attitudes towards the self. The model proposed by Lathren et al. (2020) suggests that parent attachment relates to parent self compassion, which then impacts how parents respond to children's emotional expression, thus impacting a child's attachment security which then relates to the child's level of self compassion. This model also suggests that a child's emotional expression then relates back to the parent's response to the child, which then links back to child attachment in a cyclical manner. Similarly, attachment associations are thought to be of particular importance in understanding the development of emotion regulation (Mikulincer & Shaver, 2019). It has also been shown that insecurely attached children were significantly less likely to utilise self-regulation strategies than those who are securely attached (Stefan et al., 2017). Attachment security in infants has also been shown to be related to emotion regulation in adulthood (Girme et al., 2021). Therefore, it appears that the development of both self compassion and emotion regulation may be rooted in early experiences with caregivers. Given that they appear to have similar foundations, it is reasonable to consider that there may be some conceptual overlap between these two psychological constructs.

Due to the association between self compassion and emotion regulation (Paucsik et al., 2022), and the suggestion that parent and child self compassion and emotional regulation are related (Lathren et al. 2020), it is worthwhile

further exploring the development of emotional regulation and how this relates to psychopathology. A study by Putnick et al. (2010) suggested that parenting stress increased when children were transitioning from the middle childhood stage to the adolescent stage, and that this appeared to be related to changes in parent-child interactions. Given the link between parenting stress and self compassion identified in the current review, it appears that the adolescent stage may be important in understanding this association. It has also been suggested that adolescence is a key stage when understanding the development of emotion regulation. This is thought to be related to the development of higher order cognitive skills which may allow for a greater propensity to access internal emotion regulation skills compared with earlier childhood (Skinner & Zimmer-Gembeck, 2007). It has also been suggested that adolescents may also experience a greater degree of emotional intensity and instability than what is experienced at different developmental stages, which may impact on how adolescents use emotion regulation strategies (Bailen et al., 2019). Furthermore, adolescence is considered a key developmental stage in regards to developing a sense of independence and therefore adolescents may be less likely to use external emotion regulation strategies (such as seeking comfort from others) and more likely to use internal emotion regulation strategies (such cognitive reappraisal) compared to younger children who may rely more on their caregivers to help them regulate their emotions (Skinner & Zimmer-Gembeck, 2007). Furthermore, adolescence also may be an important stage with regards to the vulnerabilities of experiencing difficulties with mental health, when compared to other age groups. It has been noted that adolescence is a time when mental health difficulties commonly emerge (Kessler et al., 2012). Therefore, adolescence appears to be a key time in the consideration of how emotions are experienced, regulated, and how this may relate to psychopathology.

Given that self compassion may be related to psychopathology through emotion regulation (Inwood & Ferrari, 2018), and given the conceptual issues raised by the current review, self compassion may be best understood within the broader emotion regulation framework. Thus, research exploring how emotion regulation more broadly is related to psychopathology may be worthwhile. Furthermore, given the importance of the adolescent stage in emotional regulation, and the vulnerabilities of this stage in terms of psychopathology, it is important to consider how emotion regulation relates to aspects of psychopathology over time. This is also supported by the model proposed by Lathren et al. (2020) which highlights the possible role that emotion regulation can play in the development of self compassion and attachment, through how parents/caregivers respond to a child's emotions.

References

Allen, A. B., & Leary, M. R. (2010). Self-Compassion, stress, and coping. *Social and personality psychology compass*, *4*(2), 107-118.

Bailen, N. H., Green, L. M., & Thompson, R. J. (2019). Understanding emotion in adolescents: A review of emotional frequency, intensity, instability, and clarity. *Emotion Review*, *11*(1), 63-73.

Bates, G. W., Elphinstone, B., & Whitehead, R. (2021). Self-compassion and emotional regulation as predictors of social anxiety. *Psychology and Psychotherapy: Theory, Research and Practice*, *94*(3), 426-442.

Diedrich, A., Grant, M., Hofmann, S. G., Hiller, W., & Berking, M. (2014). Self-compassion as an emotion regulation strategy in major depressive disorder. *Behaviour research and therapy*, *58*, 43-51.

Finlay-Jones, A. L. (2017). The relevance of self-compassion as an intervention target in mood and anxiety disorders: A narrative review based on an emotion regulation framework. *Clinical Psychologist*, *21*(2), 90-103.

Girme, Y. U., Jones, R. E., Fleck, C., Simpson, J. A., & Overall, N. C. (2021). Infants' attachment insecurity predicts attachment-relevant emotion regulation strategies in adulthood. *Emotion*, *21*(2), 260.

Inwood, E., & Ferrari, M. (2018). Mechanisms of change in the relationship between self-compassion, emotion regulation, and mental health: A systematic review. *Applied Psychology: Health and Well-Being*, *10*(2), 215-235.

Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L., ... & Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological medicine*, *32*(6), 959-976.

Lathren, C., Bluth, K., & Zvara, B. (2020). Parent self-compassion and supportive responses to child difficult emotion: An intergenerational theoretical model rooted in attachment. *Journal of family theory & review*, *12*(3), 368-381.

MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical psychology review*, *32*(6), 545-552.

Mikulincer, M., & Shaver, P. R. (2019). Attachment orientations and emotion regulation. *Current opinion in psychology*, *25*, 6-10.

McRae, K. & Gross, J. J. (2020). Fundamental questions in emotion regulation. *Emotion*. *20*(1).

Muris, P., & Otgaar, H. (2020). The process of science: A critical evaluation of more than 15 years of research on self-compassion with the Self-Compassion Scale. *Mindfulness*, *11*, 1469-1482.

Neff, K. (2003a). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and identity*, *2*(2), 85-101.

Paucsik, M., Nardelli, C., Bortolon, C., Shankland, R., Leys, C., & Baeyens, C. (2023). Self-compassion and emotion regulation: testing a mediation model. *Cognition and Emotion*, *37*(1), 49-61.

Putnick, D. L., Bornstein, M. H., Hendricks, C., Painter, K. M., Suwalsky, J. T., & Collins, W. A. (2010). Stability, continuity, and similarity of parenting stress in European American mothers and fathers across their child's transition to adolescence. *Parenting: Science and practice*, *10*(1), 60-77.

Sloan, E., Hall, K., Moulding, R., Bryce, S., Mildred, H., & Staiger, P. K. (2017). Emotion regulation as a transdiagnostic treatment construct across anxiety, depression, substance, eating and borderline personality disorders: A systematic review. *Clinical psychology review*, *57*, 141-163.

Skinner, E. A., & Zimmer-Gembeck, M. J. (2007). The development of coping. *Annu. Rev. Psychol.*, *58*, 119-144.

Sroufe, L. A. (2009). The concept of development in developmental psychopathology. *Child development perspectives*, *3*(3), 178-183.

Ștefan, C. A., Avram, J., & Miclea, M. (2017). Children's awareness concerning emotion regulation strategies: Effects of attachment status. *Social Development*, *26*(4), 694-708.

Trompetter, H. R., De Kleine, E., & Bohlmeijer, E. T. (2017). Why does positive mental health buffer against psychopathology? An exploratory study on self-compassion as a resilience mechanism and adaptive emotion regulation strategy. *Cognitive therapy and research*, *41*, 459-468.

Wolgast, M., Lundh, L. G., & Viborg, G. (2013). Cognitive restructuring and acceptance: An empirically grounded conceptual analysis. *Cognitive Therapy and Research*, *37*, 340-351.

Chapter 3

Abstract

Background: Emotion regulation is thought to be related to psychopathology, and it appears that adolescence is an important stage in understanding the development of emotion regulation.

Method: The current study explored the association between emotion regulation and psychopathology in a sample of 1083 adolescents (12-25 years; 67% female, 33% male).

Results: Canonical correlation analysis revealed that internal and external dysfunctional emotion regulation showed strong canonical function coefficients in the model, as did symptoms of anxiety and depression. Age did not moderate the relationship between dysfunctional emotion regulation and anxiety and depression in this sample.

Conclusions: This study shows that dysfunctional aspects of emotion regulation may be more important in understanding the association between emotion regulation and psychopathology than the use of more functional emotion regulation strategies.

Introduction

Adolescence is thought to be a key development stage when considering the emergence of psychopathology (Kessler et al., 2012), and it is also a time characterised by changes in how emotions are experienced and their stability (Bailen et al., 2019). Emotion regulation can be broadly described as an individual's attempts to influence emotions in themselves or in other people (McRae & Gross, 2020). Emotion regulation appears to develop and change from childhood into adolescence (Skinner & Zimmer-Gembeck, 2007) and is thought to be a key construct in understanding the underlying mechanisms of psychopathology (Sloan et al., 2017) Therefore, understanding how emotion regulation relates to psychopathology at this key developmental stage is important. Thus, the current study will explore how emotion regulation is related to symptoms of psychopathology across the adolescent stage.

Emotion Regulation

Research exploring emotion regulation has increased greatly since 1990, with more than 10,000 papers on emotion regulation being published by 2013 (Gross, 2015). Despite the increase in research into emotion regulation in recent years, a criticism of the research in the field is that there is a broad range of ways of defining the construct of emotion regulation, which has implications for the heterogeneity of the research (Berking & Wupperman, 2012). Nonetheless, this broad range of definitions and conceptualisations could also be regarded as beneficial, as this could allow for more rigorous assessment of the construct of emotion regulation which could, in turn, increase the integrity of emotion regulation as a psychological construct within the field.

The stage at which emotion regulation processes are enacted, following situations where emotions have been evoked, has been the focus of some conceptualisations of emotion regulation. The "process model" of emotion regulation suggests that emotions may be regulated at various points in the process of emotion generation:- selection of the situation; situation modification; attentional deployment; and cognitive change; and that they can also be regulated at the modulation of experiential, physiological, and behavioural responses stage (Gross, 2002). Although this model suggests that an individual may use intrapersonal skills to regulate their emotions, there has been a shift more recently in research to explore the use of interpersonal emotion regulation strategies. For example, it has been suggested that the role of the social and environmental contexts must be considered when exploring emotion regulation. One such model which attempts to conceptualise the role of interpersonal strategies in emotion regulation is the model proposed by Zaki & Williams (2013). According to this model, an individual may engage in

intrinsic, interpersonal emotion regulation – where they seek out support from another person to help them regulate their emotion- or engage in extrinsic, interpersonal emotion regulation – where they offer to support another individual to help regulate the other person's emotions (Zaki & Williams, 2013). As well as offering support to another person to help them regulate their emotions, an individual may receive support from an external source to help them emotionally regulate (Phillips & Power, 2007).

Considering both the use of internal and external emotion regulation strategies may be of particular relevance within the adolescent context. Research has suggested that emotion regulation is not static and can change over time (Cole, 2014). In infancy, there is thought to be a large dependency on the caregiver to help regulate the infant's emotions (Morris et al., 2007). However, as children develop, it is thought that by middle childhood, there is a shift towards emotions being regulated through more intrinsic processes (Skinner & Zimmer-Gembeck, 2007). Therefore, it is important to consider child and adolescent emotion regulation within a framework which includes both internal and external emotion regulation strategies, such as that proposed by Phillips & Power (2007). The shift from childhood to adolescence is thought to be a particularly pertinent time when considering how emotions are experienced. The shift to early adolescence has been shown to be associated with a decrease in positive emotions (Larson et al., 2002), and adolescence is thought to be a time where a greater emotional intensity and emotional instability is experienced (Bailen et al., 2019). These factors mean that adolescence is a particularly important stage in the development of emotion regulation skills, and perhaps adolescents are at an increased risk of experiencing difficulties with emotion regulation. Furthermore, adolescence is considered to be a key stage in the development of higher order thinking skills, which are thought to allow for the utilisation of more meta-cognitive methods of coping and regulating (Skinner & Zimmer-Gembeck, 2007). Thus, this time of increased emotional intensity, combined with the development of a greater use of cognitive skills, emphasises the importance of understanding emotion regulation during this developmental stage.

Along with emotion regulation strategies being understood within a framework which categorises them as being internal or external (Phillips & Power, 2007), there has also been suggestions that emotion regulation strategies can be either helpful or unhelpful. For example, meta-analysis findings demonstrated that the use of some emotion regulation strategies (rumination, avoidance and suppression) were associated with psychopathology, thus labelling

these as maladaptive strategies, while other emotion regulation strategies (acceptance, reappraisal and problem solving) were more adaptive, as they were related to less psychopathology (Aldao et al., 2010). However, constructing emotion regulation strategies as being either adaptive or maladaptive has also faced criticism. Tull & Aldao (2015) state that the wider context within which the emotion is being regulated is important in order to fully understand whether an emotion regulation strategy is adaptive or maladaptive, and that one emotion regulation strategy used in one situation may be adaptive, while in another situation it may be more maladaptive.

Emotion Regulation and Psychopathology in Adolescence

It has been shown that adolescence is a key developmental stage when considering the age on onset of many mental health problems (Kessler et al., 2012), with adolescence being a time at which anxiety and mood disorders commonly emerge (McGorry et al., 2011). A review found that around one in five adolescents have a psychiatric disorder and that there appear to be differences in the ways in which different disorders develop over time (Costello et al., 2011). They found that depression, panic disorder, agoraphobia and substance use disorder increase from childhood to adolescence, and that these rates continue to increase from adolescence to adulthood, whereas disorders such as Attention Deficit Hyperactivity Disorder (ADHD) and separation anxiety decreased from childhood to adolescence, and decreased further into adulthood (Costello et al., 2011). It has been demonstrated that of adults who receive a diagnosis of a mental health disorder, the majority will have experienced a mental health difficulty during adolescence (Kim-Cohen et al., 2003). Although it appears that adolescence is a key developmental period in relation to psychopathology, the mechanisms through which these symptoms of psychopathology develop during adolescence remains unclear. Due to the association between psychopathology and emotion regulation (Sloan et al., 2017), it has been argued that emotion regulation may be an important variable when considering how psychopathology develops during adolescence.

Gender differences have also been noted in regards to emotion regulation, with women reporting more use of most emotion regulation strategies that men, but that there are not any apparent differences in how emotion regulation relates to psychopathology between men and women (Nolen-Hoeksema, 2012). It also appears that there are changes which occur across the adolescent stage in terms of emotion regulation and symptoms of psychopathology. For

example, Gullone et al. (2010) found that use of emotion regulation strategies, such as expressive suppression and cognitive reappraisal, changed over time in a child and adolescent sample. Zimmerman and Iwanski (2014) found that for anger and sadness, early adolescents reported a greater use of adaptive emotion regulation strategies than those in middle adolescence, but that they reported less use of these adaptive emotion regulation strategies than those in later adolescence. Therefore, it does not appear to be the case that emotion regulation skills develop in a progressive, linear way during adolescence. It has been argued that, as emotion regulation and psychopathology appear dynamic, a developmental psychopathology framework may be helpful (Aldao et al., 2016). Nonetheless, a recent meta-analysis found that it is unclear how emotion regulation and symptoms of psychopathology develop as they found limited evidence of differences in the association between emotion regulation and psychopathology in childhood compared to adolescence (Compas et al., 2017). Therefore, Compas et al. (2017) suggest that exploring how the association between emotion regulation and psychopathology develops over time is important for identifying possible sensitive periods which may be a key target area for interventions.

Emotion Regulation and Psychopathology

It has been proposed that emotion regulation may be an important transdiagnostic construct when considering the underlying mechanisms of psychopathology (Sloan et al., 2017). Support for this view of emotion regulation as a transdiagnostic construct can be found in studies which demonstrate an association between emotion regulation and mental health difficulties. For example, emotion regulation is thought to be an important factor when considering eating behaviour. In a recent systematic review, it has been demonstrated in both cross sectional and longitudinal studies that there is a negative association between emotional regulation and overeating behaviour, with internal dysfunctional emotion regulation strategies (i.e. lack of emotional awareness, suppression, and difficulties in describing emotions) being associated with more maladaptive eating behaviours (Favieri et al., 2021). Brockmeyer et al. (2014) demonstrated that compared to healthy normal and over-weight controls, people with Anorexia Nervosa, Bulima Nervosa and Binge Eating Disorder showed greater emotion regulation difficulties. Furthermore, in a recent systematic review, it has been highlighted that emotional dysregulation and use of maladaptive emotion regulation strategies have been found to decrease following psychological intervention for anxiety, depression, substance use, eating pathology and Borderline Personality Disorder (Sloan et al., 2017). Using structural equation

modelling, one study found that negative affectivity and emotion regulation contributed to symptoms of anxiety which then significantly predicted depressive symptomatology (Tortella-Feliu et al., 2010). A recent meta-analysis revealed that internal maladaptive emotion regulation strategies (such as rumination, avoidance of emotions, and suppression) showed large associations with anorexia nervosa and bulimia nervosa (Prefit et al., 2019). Another study found that internal emotion regulation strategies (functional and dysfunctional) were significantly associated with compulsive exercise in both adolescent boys and girls, whereas external functional emotion regulation strategies were only significantly related to compulsive exercise in boys, not girls (Goodwin et al., 2012). This indicates that there may be some gender differences in how internal/external functional and dysfunctional emotion regulation strategies are related to compulsive exercise. It may also be the case that internal emotion regulation strategies (both functional and dysfunctional) may be of particular importance when understanding compulsive exercise in adolescent boys, compared to external emotion regulation strategies. On the other hand, in a recent systematic review, it has been demonstrated in both cross sectional and longitudinal studies that there is a negative association between emotional regulation and overeating behaviour, with internal dysfunctional emotion regulation strategies (i.e. lack of emotional awareness, suppression, and difficulties in describing emotions) being associated with more maladaptive eating behaviours (Favieri et al., 2021). Similarly, dysfunctional emotion regulation strategies (internal and external) have been shown to be associated with disordered eating (Mills et al., 2015). Therefore, it appears that the nature of emotion regulation strategies (i.e. whether they are internal or external, or functional or dysfunctional) may be differently associated with different aspects of disordered eating behaviours.

Interestingly, it may be the case that the way in which emotion regulation is related to psychopathology may differ depending on the type of difficulty experienced. For example, Lukas et al. (2017) found significant differences in emotion regulation in people with different diagnoses, as individuals with depression had significantly lower emotion regulation than those with other diagnoses. In a meta-analysis, it has been shown that different internal emotion regulation strategies are linked to anxiety and depressive symptomatology, and that greater use of internal adaptive emotion regulation strategies and less use of maladaptive emotion regulation strategies are important in terms of symptoms of psychopathology in adolescence (Schafer et al., 2017). It has also been shown that external emotion regulation skills predict depression and psychosomatic symptoms in adolescents (Yidiz & Duy, 2019).

Meta-analysis findings also indicate that emotion regulation strategies were more related to internalising psychopathology symptoms than externalising psychopathology symptoms (Aldao et al., 2010). The study by Lukas et al. (2017) also found that specific components of emotion regulation differ depending on the mental health difficulty being experienced. Similarly, a meta-analysis demonstrated that the effect size for the association between different emotion regulation strategies and symptoms of psychopathology (anxiety, depression, eating, and substance related difficulties) varied, with rumination having a large effect size, avoidance, problem solving, and suppression having a medium to large effect size, and reappraisal and acceptance having a small to medium effect size (Aldao et al., 2010). Garnefski et al. (2005) found that, in an adolescent sample, there were differences in the associations between cognitive emotion regulation strategies and internalising and externalising problems, in that those with internalising problems scored higher on self-blame and rumination cognitive emotion regulation strategies than those with externalising problems. This highlights the importance of exploring different aspects of emotion regulation and symptoms of psychopathology, as these may be important when considering psychological interventions which aim to increase emotion regulation skills. Symptoms of anxiety and depression have also been linked to eating behaviour. In a sample of university students one study demonstrated that unhealthy eating was significantly associated with the prevalence of stress, anxiety and depression (Ramon-Arbuez et al., 2019).

However, there have been some methodological criticisms of the extant research which explores the association between emotion regulation and symptoms of psychopathology. One such criticism is that it is possible that there may be some overlap between the measurements of some aspects of emotion regulation and the measurements of psychopathology symptoms (Aldao et al., 2010). Thus, this calls into question the view that emotion regulation may be a transdiagnostic construct important in understanding psychopathology. It could be the case that these associations are only observed due to an overlap with the measurements of these constructs within the extant research. Another criticism of the existing research in the field of emotion regulation and psychopathology in adolescence is that often measures of emotion regulation do not take into account the context in which emotions arise (Compas et al., 2017). Not considering the context of emotion regulation could be problematic as individual adolescents may experience very different challenges in their lives which, in turn, may present differing challenges in terms of emotion regulation and so this may be overlooked in existing research. Meta analysis has also highlighted differences in the associations between emotion regulation and psychopathology in clinical and non clinical samples, with some emotion regulation strategies (avoidance, suppression, problem solving, and rumination)

showing stronger associations with psychopathology symptoms in clinical populations than in non clinical populations (Aldao et al., 2010).

The Current Study

This study aims to explore the relationships between emotion regulation, eating behaviour, anxiety, and depression across the adolescent age range. As discussed, it is essential to understand how these difficulties emerge and develop during the adolescent stage of development, as this is commonly the time at which symptoms of psychopathology emerge and appears to be a key stage in the development of many psychopathology symptoms. The emotional intensity experienced and changes in cognition that occur during adolescence, as reported by previous research, emphasises the importance of exploring emotion regulation during the adolescent stage of development, as this may be a stage in which individuals are particularly vulnerable to emotional dysregulation. The research also suggests that emotion regulation may play an important transdiagnostic role in relation to different mental health problems, therefore this study will also explore the association between emotion regulation and anxiety, depression and eating behaviours during adolescence. This will aim to address the gaps in the research by providing an insight into how these variables are related across adolescence. In order to achieve these aims, the current study proposes two main hypotheses and one further hypothesis:

Hypothesis 1 – There will be a significant association between emotion regulation and anxiety, depression, and eating behaviour in adolescence, with positive associations between dysfunctional emotion regulation and psychopathology measures, and a negative association between functional emotion regulation and psychopathology.

Hypothesis 2 – The association between emotion regulation and psychopathology will be moderated by age, with this association increasing over time. The significant factors identified from the analysis of hypothesis 1 will help inform this more specifically.

Hypothesis 3 - There will be significant differences between males and females on scores of emotion regulation and psychopathology. The important factors identified from the analysis of hypothesis 1 will help inform this more specifically.

Methodology

Study Design

This study was a secondary data analysis. Data were collected as part of the Perfectionism and Mental Health in Adolescence project. The current researcher had no involvement in the data collection process. The data were collected using a cross sectional survey design. The school aged participants were recruited using a combination of opt-out and opt-in consent processes (one school used opt-in and one used opt-out), whereas the university participants were recruited using an opt-in consent process.

Participants

There was a total of 1083 participants in this study. The data has been collected from individuals aged between 12-25 years. Of the 1083 participants, 712 were female, 355 were male, 4 were transgender, and 12 declined to answer. Participant ages ranged from 12-26 (M=17.79, SD=3.25).

Inclusion/exclusion criteria

For the university sample, the main inclusion criteria was that participants were current or recent university students in Scotland and no exclusion criteria was set. For the school samples, all school pupils at two private schools in three year groups (S1, S3 and S5) were eligible for inclusion. The exclusion criteria for this sample included participants with limited reading ability or English language as this would prevent participation. In the community sample, young adults either enrolled in college, seeking employment or employed part or full time were eligible for inclusion in the study. Again, limited reading ability or English language would prevent participation and therefore this was an exclusion criteria.

Procedure

This study used a cross sectional design. Samples were recruited from the Edinburgh, Scotland area. The university had a mix of students from Scotland, other regions of the UK, and international students. All data were gathered within an approximately 18 month period, and the data were collected prior to the COVID-19 pandemic. Participants were asked to complete an online questionnaire, made up of the measures detailed below, along with

demographic questions. For participants under the age of 16, consent was sought from both the individual themselves as well as their parent/caregivers. Some participants were recruited through the use of opt-out consent forms, whereas others were recruited with opt-in consent forms.

Measures

Eating Attitudes Test (EAT-26, Garner et al., 1982)

This 26 item self-report measure screens for unhealthy attitude towards eating and weight in the general population. Items are scored on a 6 point Likert scale. An overall total score was generated, as well as 3 subscale scores – dieting, bulimia and food preoccupation, and oral control. A clinical cut off score of ≥20 indicated possible eating disorder (Garner et al., 1982). A study using this measure in a sample of adolescents demonstrated an internal consistency of α=0.91 for total score (Furnham et al., 2002). In the current study, internal consistency for this measure was α=0.96 for total score. This measure has also demonstrated adequate validity, in that it was highly correlated with the longer version of the form, and was also shown to be correlated with measures of disordered eating and body image (Garner et al., 1982).

Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983).

This 14 item self-report measure screens for common symptoms of anxiety and depression in the general population. There were two subscale scores (Anxiety and Depression), each with 7 items, and items were rated on a 4 point Likert scale. The clinical ranges of this measure for Anxiety and Depression are: 0-7 - non clinical; 8-10 – mild, 11-14 – moderate; and ≥15 - severe (Zigmond & Snaith, 1983). The internal consistency of this measure in an adolescent population (ages 13-23 years) has been reported as α=0.54-0.78 for the depression subscale, and α=0.75-0.83 for the anxiety subscale (Jörngården et al., 2006). Previous findings have also demonstrated that this is a valid measure for use with an adolescent population, as it found adequate test-retest reliability and factor structure in an adolescent clinical and nonclinical sample (White et al. 1999). The internal consistency reported in the current study is α= 0.78 for the anxiety subscale and α= 0.76 for the depression subscale.

Regulation of Emotions Questionnaire (REQ; Phillips & Power, 2007)

This 18 item self-report measure explored how young people manage difficult feelings. Respondents were given statements and asked to rate how frequently they felt this way, on a 5 point Likert scale (from "not at all" to "always"). There were 4 subscale scores generated based on the individual's responses: internal dysfunctional; internal functional; external dysfunctional; and external functional. There was no overall total score. The internal consistency of the subscale scores have been shown to range from α=0.66-0.76 in an adolescent (ages 12-19 years) sample (Phillips & Power, 2007). The internal consistency reported in the current study was α= 0.65 for internal functional emotion regulation, α=0.74 for internal dysfunctional emotion regulation, α=0.69 for external functional emotion regulation, and α=0.78 for external dysfunctional emotion regulation. This measure has been shown to be a valid, reliable measure of emotion regulation, as it has been significantly associated with other measures of child/adolescent emotional and behavioural difficulties (Phillips & Power, 2007).

Ethics

Ethical approval for this study was granted by the University of Edinburgh School of Health in Social Science Research Ethics Committee (see Appendix E for confirmation of this).

Planned Analysis

As the data were collated from different studies, there were some aspects of data preparation which required to be carried out prior to analysis. This involved reverse scoring of required questionnaire items and individual subscale scores were created.

Hypothesis 1 – There will be a significant association between emotion regulation and anxiety, depression, and eating behaviour in adolescence.

In order to test the first hypothesis, canonical correlation analysis was carried out. Canonical correlation analysis is used to explore the association between two sets of variables, where each set of variables has two or more variables

(Thomson, 1984; Sherry & Henson, 2005). As this hypothesis involves two sets of variables (emotion regulation and psychopathology outcomes) and each of these variable sets consist of more than two variables (e.g. internal/external functional/dysfunctional emotion regulation, as well as eating behaviour, anxiety and depression). Therefore, this analysis included assessing the association between the two sets of variables – predictor variables (the 4 emotional regulation strategies) and the outcome variables (the 3 eating behaviour measures and the anxiety and depression measures). According to Stevens (1986), a small sample size of n=50 can allow for strong canonical correlations (>0.7) to be detected, whereas weaker canonical correlations (<0.3) typically require larger sample sizes (n>200). The sample size of the current study exceeds this rule of n>200, therefore this should allow for weaker canonical correlations to be identified in the current study. The data were assessed for multicollinearity through the use of principle component analysis for each set of variables which indicated that this assumption was not violated. Visual inspection of scatterplots confirmed the linearity assumption was met and visual inspection of normal probability plots for each variable revealed that the assumption of normality was met. The two largest variables highlighted as having the largest structure coefficients, indicating they are the most strongly associated with the synthetic variables created in the analysis, were then used to explore the further hypotheses.

Hypothesis 2 – The association between emotion regulation and psychopathology will be moderated by age

In order to test the second hypothesis, moderation analysis was used. This involved exploring whether the association between emotion regulation and the psychopathology measures was moderated by age. Predictor variables were centred and then interaction variables were created, to explore the interaction between each predictor and the moderator. Analysis of Variance (ANOVA) was used to test this, with the interaction effect between the dependent variables and age representing the moderator.

Hypothesis 3 - There will be significant differences between males and females on scores of emotion regulation and psychopathology

In order to test this hypothesis, Multivariate Analysis of Variance (MANOVA) was used. This involved looking at differences between males and females on the emotion regulation variables as well as the psychopathology variables. Data were assessed for normality and inspection of P-P plots demonstrated that the assumption of multivariate normality was satisfied for the variables included in the analysis. Box's test of equality of covariance

matrices showed that the assumption of homogeneity of covariance matrices was violated. Therefore, Pillai's trace statistics was used in this analysis.

Results

Descriptive statistics

Of the 1083 participants, 712(65%) were female, 355(33%) were male, 4(<1%) were transgender, 12(1%) who reported they declined to answer, and there were 7(<1%) who left this question blank. For analysis purposes, the small number of participants who reported they were transgender or declined to answer the question were removed, as these data points appeared to be outliers and the group numbers were too small to do any meaningful analysis. Table 2 demonstrates the mean and standard deviations of each of the questionnaire variables.

Table 2 – Mean and standard deviation values for each of the questionnaire variables

	Mean (Standard Deviation)	**Range**	**Mean (Standard Deviation) Males**	**Mean (Standard Deviation) Females**
Emotion Regulation – Internal Functional	16.91(3.28)	5-25	16.38 (3.57)	16.92 (3.17)
Emotion Regulation – Internal Dysfunctional	13.44(4.14)	5-25	12.83 (4.19)	13.68 (4.04)
Emotion Regulation – External Functional	18.16(4.44)	5-30	16.65 (4.50)	18.78 (4.29)
Emotion Regulation – External Dysfunctional	8.24(3.09)	5-25	8.41 (3.46)	8.13 (2.92)

Eating Behaviour - Dieting	14.09(11.08)	0-39	11.59 (11.99)	15.17 (10.37)
Eating Behaviour – Bulimia and Food Preoccupation	7.42(6.02)	0-18	5.91 (6.44)	8.10 (5.69)
Eating Behaviour – Oral Control	9.01(6.28)	0-21	6.45 (6.00)	10.20 (6.06)
Anxiety symptoms	9.60(4.35)	0-21	8.41 (4.11)	10.09 (4.32)
Depression symptoms	4.91(3.52)	0-19	5.17 (3.50)	4.75 (3.50)

Canonical Correlation Analysis

A canonical correlation analysis was conducted using the four emotion regulation variables as predictors of the anxiety, depression, and eating behaviour variables to evaluate the multivariate shared relationship between the two variable sets (i.e., emotion regulation and symptoms of psychopathology). This analysis involves the creation of synthetic variables (one synthetic variable for each set of variables), and that these synthetic variables are created to maximise the possible correlation between the two synthetic variables (Sherry & Henson, 2005). The creation of these two synthetic variables is referred to as the first function, and the analysis involves the creation of further subsequent functions, which involve the exploration of the correlations between the two sets of variables, considering the residual variance that is not explained by the first function (Sherry & Henson, 2005).

In this study, the analysis yielded four functions with squared canonical correlations of 0.47, 0.08, 0.03, and 0.003 for each successive function. Collectively, the full model across all functions was statistically significant using the Wilks's $\lambda = 0.47$ criterion, $F(20, 2239.67) = 28.60$, $p < .001$. Given that Wilks's λ demonstrates the variance unexplained by the model, $1 - \lambda$ represents the full model effect size in an r2 metric. In this analysis, for the four

canonical functions, the r2 type effect size was 0.53, which indicates that the full model explained about 53%, of the variance shared between the variable sets. Functions 2 to 4 and 3 to 4 were also statistically significant, F(12, 1788.82) = 6.98, p < .001, and F(6, 1354) = 3.73, p = .001, respectively. On the basis of the R_c^2 effects for each function, only the first function was considered noteworthy in this study as this explained about 46.91% of the variance, whereas function 2, 3, and 4 explained 8.45%, 2.92%, and 0.30% respectively. The first function with the standardised canonical function coefficient values for each variable, along with the canonical correlation coefficient for the overall function, can be seen in Figure 2. The standardised canonical function coefficient values for each variable refers to the coefficients which have been used in the linear equations which have created the synthetic variables (Sherry & Henson, 2005).

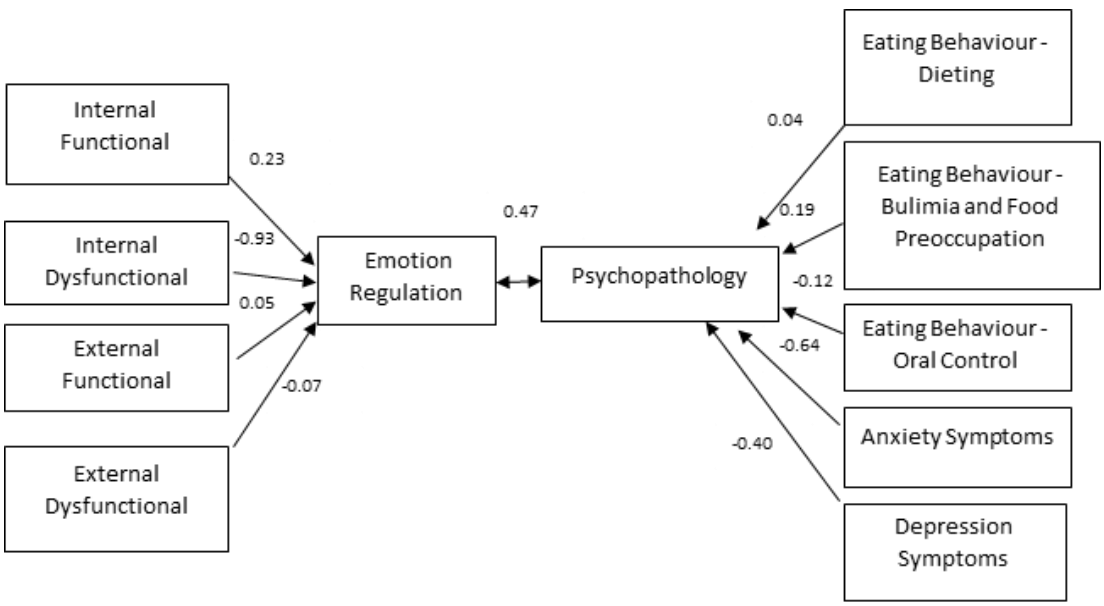

Figure 2: Canonical Correlation Coefficients for Function 1

Table 3 presents the canonical solution for emotion regulation predicting psychopathology for function 1. The structure coefficients (rs) refer to the correlation between the variables and the synthetic variable. For the function 1 coefficients, anxiety and depression were considered to be the main contributors to the synthetic criterion variable, as they have the largest standardised canonical function coefficient values, with bulimia and food preoccupation and dieting making a secondary contributions. The aspect of emotion regulation which had the largest standardised

canonical function coefficient was internal dysfunctional, whereas external dysfunctional had a large structure coefficient but a smaller function coefficient. The emotional regulation variable of internal dysfunctional was the primary contributor to the predictor variable. The dysfunctional emotion regulation variables and oral control, anxiety and depression structure coefficients were all negative. Therefore, higher scores on measures of oral control, and symptoms of anxiety and depression were associated with higher scores on the dysfunctional emotion regulation strategies in this function, supporting the first hypothesis. Higher scores on functional emotion regulation in this function were associated with lower scores on anxiety, depression and oral control, again providing support for the initial hypothesis. However, higher functional emotion regulation was associated with higher bulimia and food preoccupation and dieting which does not support the initial hypothesis. As the two dysfunctional emotion regulation components were key variables in this function, this function was labelled "dysfunctional emotion regulation."

Table 3 - Canonical solution for emotion regulation predicting psychopathology for function 1

Variable	**Coef**	**rs**	**Rs2 (%)**
Emotion regulation – internal functional	0.23	0.24	5.76
Emotion regulation – internal dysfunctional	-0.93	-0.97	94.09
Emotion regulation – external functional	0.05	0.31	9.61
Emotion regulation – external dysfunctional	-0.07	-0.43	18.49
Rc2			46.91
Eating behaviour - Dieting	0.04	0.35	12.25

Eating behaviour – bulimia and food preoccupation	0.19	0.43	18.49
Eating behaviour – Oral Control	-0.12	0.17	2.89
Anxiety symptoms	-0.64	-0.92	84.64
Depression symptoms	-0.40	-0.83	68.89

Note: Coef = standardised canonical function coefficient; rs = structure coefficient; Rs2 = structure coefficient squared.

Moderation analyses

In order to address the second hypothesis, a moderation test was run. Based on the findings of the canonical correlation analysis, moderation analysis was run with internal and external dysfunctional emotion regulation as the predictors, anxiety as the dependent variable, and age as the moderator. The interaction between internal dysfunctional emotion regulation and age was not significant (b = 0.28, SE = 0.18, t = 1.57, p =0.12). Therefore, the relationship between internal dysfunctional emotion regulation and anxiety was not moderated by age. Similarly, the interaction between external dysfunctional emotion regulation and age was not significant (b = 0.10, SE = 0.17, t = 0.56, p =0.58). Therefore, the relationship between external dysfunctional emotion regulation and anxiety was not moderated by age.

Based on the findings of the canonical correlation analysis, moderation analysis was run with internal and external dysfunctional emotion regulation as the predictors, depression as the dependent variable, and age as the moderator. The interaction between internal dysfunctional emotion regulation and age was not significant (b = 0.27, SE = 0.16, t = 1.73, p =0.08). Therefore, the relationship between internal dysfunctional emotion regulation and depression was not moderated by age. Similarly, the interaction between external dysfunctional emotion regulation and age was not

significant (b = -0.05, SE = 0.15, t = -0.39, p =0.69). Therefore, the relationship between external dysfunctional emotion regulation and depression was not moderated by age.

Gender differences

In order to test hypothesis 3, and based on the Canonical Correlation Analysis, a one way MANOVA was performed to evaluate whether there are differences on scores on the key variables of internal dysfunctional emotion regulation, external dysfunctional emotion regulation, symptoms of anxiety and symptoms of depression, between males and females. There was a significant difference between males and females on these measures, F(4,717) =7.62 p= <0.001; Pillai's trace =0.04, partial eta squared=0.04. The means and standard deviations for these variables for males and females can be seen in the table 4.

Table 4 – Means and standard deviations for scores on variables included in MANOVA based on gender

Gender	**Emotion Regulation Internal Dysfunctional M(*SD*)**	**Emotion Regulation External Dysfunctional M(*SD*)**	**Anxiety Symptoms M(*SD*)**	**Depression Symptoms M(*SD*)**
Female	13.67(4.06)	8.07(2.84)	10.23(4.36)	4.69(3.55)
Male	12.71(4.05)	7.97(2.90)	8.85(3.82)	4.86(3.42)

Separate univariate ANOVAs on the outcome variables revealed significant effects of gender on symptoms of anxiety (F(1,720)=14.61, p<0.001, partial eta squared=0.02) and emotion regulation internal dysfunctional (F(1, 720)=7.50, p=0.01, partial eta squared=0.01). The separate univariate ANOVAs on the outcome variables revealed a non-significant effect of gender on symptoms of depression (F(1,720)=0.32, p=0.57, partial eta squared<0.001) and emotion regulation external dysfunctional (F(1, 720)=1.50, p=0.67, partial eta squared<0.001).

Summary of results

Results from the canonical correlation analysis revealed a cluster which represented the links between emotion regulation and psychopathology in adolescence. This cluster, labelled dysfunctional emotion regulation, demonstrated that the key components of emotional regulation identified were internal and external dysfunction, and that in terms of psychopathology, symptoms of anxiety and depression were identified as the corresponding variables. The between group analyses demonstrated significant differences on internal dysfunctional and external dysfunctional emotion regulation, and significant differences between males and females on internal dysfunctional emotion regulation and symptoms of anxiety, with females showing greater internal dysfunctional emotion regulation and higher levels of anxiety symptoms.

Discussion

This study demonstrated insights into how facets of emotion regulation were related to mental health variables during adolescence. Canonical correlation analysis allowed for a novel insight into the association between emotion regulation and psychopathology, by highlighting the importance of specific emotion regulation strategies and specific elements of psychopathology. This exploratory technique has allowed for all facets of emotion regulation and facets of psychopathology to be explored together, thus highlighting which aspects were of most importance in understanding the association between these two broader constructs. Although previous research has highlighted a relationship between emotion regulation and psychopathology, this exploratory technique allowed for the nature of this association to be fully explored.

Association between emotion regulation and psychopathology

Canonical correlation analysis revealed a function for which internal dysfunctional and external dysfunctional emotion regulation displayed the strongest canonical function coefficients, and anxiety and depression also demonstrating high canonical function coefficients. Those who were higher in internal and external dysfunctional emotion regulation skills experienced higher levels of anxiety, depression, bulimia and food preoccupation, and dieting. This finding is in line with a previous meta analysis which found that the use of maladaptive internal emotion regulation strategies was related to anxiety and depression (Aldao et al., 2010) and this was also supported by the current study. However, the functional emotion regulation strategies (both internal and external) were not

shown to have strong canonical function coefficients in this model, which indicates that they may not be as important in understanding the nature of the relationship between emotion regulation and psychopathology in adolescence. This finding is not in line with a previous meta analysis which have demonstrated that the use of adaptive internal emotion regulation skills, such as cognitive reappraisal, problem solving and acceptance, were significantly related to anxiety and depression in an adolescent population (Schafer et al., 2017). These differences found in the current study may provide support for the view that conceptualising emotion regulation strategies in a binary, helpful/unhelpful manner may be problematic as it does not take into consideration the wider context (Tull & Aldao, 2015). On the other hand, these findings could be indicative of a more meaningful role for maladaptive emotion regulation in regards to psychopathology in adolescent populations. This would be important in regards to considering possible areas of intervention, as it may be the case that the use of maladaptive emotion regulation strategies is more important than the use of adaptive strategies when thinking about adolescent psychopathology.

Another important finding from the canonical correlation analysis was that eating behaviours showed weaker canonical function coefficients than anxiety and depression, thus suggesting that they may be less important in understanding the relationship between emotion regulation and psychopathology in adolescence. Higher functional emotion regulation was associated with higher bulimia and food preoccupation and dieting in this model. This does not support previous findings which suggest that dysfunctional emotion regulation was associated with disordered eating in adolescence (Mills et al., 2015). Therefore, the current findings indicate that it may be helpful to further explore the association between the use of adaptive emotion regulation and different aspects of eating behaviour. The current findings are also not in line with previous findings which have suggested that internal emotion regulation strategies have been significantly associated with eating disorders (Prefit et al., 2019) and compulsive exercise (Goodwin et al. 2012). Therefore, although there may be an association between emotion regulation and aspects of eating behaviour, the current findings suggest that when considering the relationship between emotion regulation and psychopathology more broadly, eating behaviour may be of less importance than other aspects of psychopathology (i.e. anxiety and depression). However, it may also be the case that the conceptualisation of emotion regulation strategies as functional or dysfunctional may not fully capture how adaptive an emotion regulation strategy is in particular context. Again, due to the unique developmental and social changes that occur during adolescence, including a shift from relying on caregivers for emotion regulation to being able to do this more

independently (Skinner & Zimmer-Gembeck, 2007), this could suggest that exploring the context of emotional regulation at this developmental stage is important.

This study also showed significant differences between males and females with regards to internal dysfunctional emotion regulation and anxiety, with females reporting higher levels of internal dysfunction emotion regulation and anxiety than males. No significant gender differences were noted for external dysfunctional emotion regulation and depression in this sample. This may be indicative of unique differences in the relationships between some aspects of emotion regulation and psychopathology between men and women. This is not in line with previous findings, which suggested that although there are differences in emotion regulation strategies between men and women, there does not appear to be gender differences in how emotion regulation is associated with psychopathology (Nolen-Hoeksema, 2012). However, it is worth noting that from a statistical standpoint, the assumption of homogeneity of covariance matrices was violated in this analysis in the current study and therefore these gender differences should be interpreted with caution.

The effect of age

The current study demonstrated that age did not moderate the association between dysfunctional emotion regulation (both internal and external dysfunctional emotion regulation strategies) and anxiety and depression. This finding does not support previous research which suggests that as adolescents develop, they are less likely to rely on external emotion regulation strategies (Skinner & Zimmer-Gembeck, 2007), thus this would have suggested that age may have been an important factor in the association between external dysfunctional emotion regulation and symptoms of anxiety and depression. The lack of age as a moderating factor also does not support the findings from previous studies which have suggested that certain symptoms of psychopathology increase across adolescence, such as depression (Costello et al., 2011). Therefore, the current findings suggest that although dysfunctional emotion regulation and anxiety and depressive symptoms are related during adolescence, age does not appear to be an important factor in moderating this relationship. It is worth noting, however, that the current study is cross sectional in nature and it may be the case that there are changes in this association which occur over time that are not able to be picked up by this study design. This may be indicative of the need for more longitudinal studies, which explore how symptoms of psychopathology develop and change over time across the adolescent stage.

Limitations of the current study and suggestions for future research

The main limitation of the current study is its cross-sectional design, and therefore it can only provide a snapshot of the associations between emotion regulation, anxiety, depression and eating behaviour in adolescence. Nonetheless, these variables were measured across ages within the developmental period. However, the current study did not demonstrate any moderation effects of age on the association between emotion regulation and psychopathology. In order to further explore the change in emotion regulation, eating behaviour, anxiety and depression across adolescence over time, future research may wish to consider studies with a longitudinal design. The current study also has limitations in terms of methodology as, due to the varying method of data collection, there was no meaningful way of collating ethnicity data. This meant that this variable was not able to be included in the analysis. Another possible limitation of the current study is the way in which emotional regulation has been operationalised, particularly the conceptualisation of emotion regulation as adaptive or maladaptive. Although some research has supported this conceptualisation (Phillips & Power, 2007), it has faced criticism as being too simplistic and may overlook some more nuanced differences that exist within different context.

Implications

This study has shown that the use of dysfunctional emotion regulation strategies (both internal and external) are particularly important with regards to psychopathology in adolescents, and that these may be more important in relation to anxiety and depression than eating behaviours in this population. Therefore, this has some potential implications when considering the focus of interventions aimed at improving emotional regulation and reducing psychopathology. Although the current study is correlational in nature and cannot demonstrate any cause and effect relationship, the findings may still be indicative of a particularly important association between maladaptive emotion regulation strategies (as opposed to the use of adaptive emotion regulation strategies) and symptoms of anxiety and depression.

Conclusions

This study found that certain facets of emotion regulation predicted different mental health variables. It demonstrated that dysfunctional emotion regulation (both internal and external) and symptoms of anxiety and

depression were the most important facets in understanding how emotion regulation and psychopathology are related in an adolescent population. This could help inform future research and intervention efforts which aim to promote functional emotional regulation skills and reduce symptoms of psychopathology in adolescence.

References

Aldao, A., Gee, D. G., De Los Reyes, A., & Seager, I. (2016). Emotion regulation as a transdiagnostic factor in the development of internalizing and externalizing psychopathology: Current and future directions. *Development and psychopathology*, *28*(4pt1), 927-946.

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical psychology review*, *30*(2), 217-237.

Bailen, N. H., Green, L. M., & Thompson, R. J. (2019). Understanding emotion in adolescents: A review of emotional frequency, intensity, instability, and clarity. *Emotion Review*, *11*(1), 63-73.

Berking, M., & Wupperman, P. (2012). Emotion regulation and mental health: recent findings, current challenges, and future directions. *Current opinion in psychiatry*, *25*(2), 128-134.

Brockmeyer, T., Skunde, M., Wu, M., Bresslein, E., Rudofsky, G., Herzog, W., & Friederich, H. C. (2014). Difficulties in emotion regulation across the spectrum of eating disorders. *Comprehensive psychiatry*, *55*(3), 565-571.

Cole, P. M. (2014). Moving ahead in the study of the development of emotion regulation. *International Journal of Behavioral Development*, *38*(2), 203-207.

Compas, B. E., Jaser, S. S., Bettis, A. H., Watson, K. H., Gruhn, M. A., Dunbar, J. P., ... & Thigpen, J. C. (2017). Coping, emotion regulation, and psychopathology in childhood and adolescence: A meta-analysis and narrative review. *Psychological bulletin*, *143*(9), 939.

Costello, E. J., Copeland, W., & Angold, A. (2011). Trends in psychopathology across the adolescent years: what changes when children become adolescents, and when adolescents become adults?. *Journal of child psychology and psychiatry*, *52*(10), 1015-1025.

Favieri, F., Marini, A., & Casagrande, M. (2021). Emotional regulation and overeating behaviors in children and adolescents: a systematic review. *Behavioral Sciences*, *11*(1), 11.

Furnham, A., Badmin, N., & Sneade, I. (2002). Body image dissatisfaction: Gender differences in eating attitudes, self-esteem, and reasons for exercise. *The Journal of psychology*, *136*(6), 581-596.

Garnefski, N., Kraaij, V., & van Etten, M. (2005). Specificity of relations between adolescents' cognitive emotion regulation strategies and internalizing and externalizing psychopathology. *Journal of adolescence*, *28*(5), 619-631.

Garner, D. M., Olmsted, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The eating attitudes test: psychometric features and clinical correlates. *Psychological medicine*, *12*(4), 871-878.

Goodwin, H., Haycraft, E., & Meyer, C. (2012). The relationship between compulsive exercise and emotion regulation in adolescents. *British Journal of health psychology*, *17*(4), 699-710.

Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, *39*(3), 281-291.

Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological inquiry*, *26*(1), 1-26.

Gullone, E., Hughes, E. K., King, N. J., & Tonge, B. (2010). The normative development of emotion regulation strategy use in children and adolescents: A 2-year follow-up study. *Journal of Child Psychology and Psychiatry*, *51*(5), 567-574.

Jörngården, A., Wettergen, L., & von Essen, L. (2006). Measuring health-related quality of life in adolescents and young adults: Swedish normative data for the SF-36 and the HADS, and the influence of age, gender, and method of administration. *Health and quality of life outcomes*, *4*(1), 1-10.

Kessler, R. C., Avenevoli, S., McLaughlin, K. A., Green, J. G., Lakoma, M. D., Petukhova, M., ... & Merikangas, K. R. (2012). Lifetime co-morbidity of DSM-IV disorders in the US national comorbidity survey replication adolescent supplement (NCS-A). *Psychological medicine*, *42*(9), 1997-2010.

Kim-Cohen, J., Caspi, A., Moffitt, T. E., Harrington, H., Milne, B. J., & Poulton, R. (2003). Prior juvenile diagnoses in adults with mental disorder: developmental follow-back of a prospective-longitudinal cohort. *Archives of general psychiatry*, *60*(7), 709-717.

Larson, R. W., Moneta, G., Richards, M. H., & Wilson, S. (2002). Continuity, stability, and change in daily emotional experience across adolescence. *Child development*, *73*(4), 1151-1165.

Lukas, C. A., Ebert, D. D., Fuentes, H. T., Caspar, F., & Berking, M. (2017). Deficits in general emotion regulation skills–Evidence of a transdiagnostic factor. *Journal of clinical psychology*, *74*(6), 1017-1033.

McGorry, P. D., Purcell, R., Goldstone, S., & Amminger, G. P. (2011). Age of onset and timing of treatment for mental and substance use disorders: implications for preventive intervention strategies and models of care. *Current opinion in psychiatry*, *24*(4), 301-306.

McRae, K. & Gross, J. J. (2020). Fundamental questions in emotion regulation. *Emotion*. *20*(1).

Mills, P., Newman, E. F., Cossar, J., & Murray, G. (2015). Emotional maltreatment and disordered eating in adolescents: Testing the mediating role of emotion regulation. *Child abuse & neglect*, *39*, 156-166.

Morris, A. S., Silk, J. S., Steinberg, L., Myers, S. S., & Robinson, L. R. (2007). The role of the family context in the development of emotion regulation. *Social development*, *16*(2), 361-388.

Nolen-Hoeksema, S. (2012). Emotion regulation and psychopathology: The role of gender. *Annual review of clinical psychology*, *8*, 161-187.

Phillips, K. F. V., & Power, M. J. (2007). A new self-report measure of emotion regulation in adolescents: The Regulation of Emotions Questionnaire. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice*, *14*(2), 145-156.

Prefit, A. B., Candea, D. M., & Szentagotai-Tătar, A. (2019). Emotion regulation across eating pathology: A meta-analysis. *Appetite*, *143*, 104438.

Ramón-Arbués, E., & JM, G. L. (2019). Eating behavior and relationships with stress, anxiety, depression and insomnia in university students. *Nutricion hospitalaria*, *36*(6), 1339-1345.

Schäfer, J. Ö., Naumann, E., Holmes, E. A., Tuschen-Caffier, B., & Samson, A. C. (2017). Emotion regulation strategies in depressive and anxiety symptoms in youth: A meta-analytic review. *Journal of youth and adolescence*, *46*, 261-276.

Sherry, A., & Henson, R. K. (2005). Conducting and interpreting canonical correlation analysis in personality research: A user-friendly primer. *Journal of personality assessment*, *84*(1), 37-48.

Skinner, E. A., & Zimmer-Gembeck, M. J. (2007). The development of coping. *Annu. Rev. Psychol.*, *58*, 119-144.

Sloan, E., Hall, K., Moulding, R., Bryce, S., Mildred, H., & Staiger, P. K. (2017). Emotion regulation as a transdiagnostic treatment construct across anxiety, depression, substance, eating and borderline personality disorders: A systematic review. *Clinical psychology review*, *57*, 141-163.

Stevens, J. (1986). Principal components. *Applied Multivariate Statistics for the Social Sciences. Hillsdale, NJ: Lawrence Erlbaum Associate Publishers*.

Thompson, B. (1984). *Canonical correlation analysis: Uses and interpretation* (No. 47). Sage.

Tortella-Feliu, M., Balle, M., & Sesé, A. (2010). Relationships between negative affectivity, emotion regulation, anxiety, and depressive symptoms in adolescents as examined through structural equation modeling. *Journal of Anxiety Disorders*, *24*(7), 686-693.

Tull, M. T., & Aldao, A. (2015). Editorial overview: New directions in the science of emotion regulation. *Current opinion in psychology*, *3*, iv-x.

White, D., Leach, C., Sims, R., Atkinson, M., & Cottrell, D. (1999). Validation of the Hospital Anxiety and Depression Scale for use with adolescents. *The British Journal of Psychiatry*, *175*(5), 452-454.

Yıldız, M. A., & Duy, B. (2019). The predictive role of emotion regulation strategies on depressive and psychosomatic symptoms in adolescents. *Current Psychology*, *38*, 387-396.

Zaki, J., & Williams, W. C. (2013). Interpersonal emotion regulation. *Emotion*, *13*(5), 803.

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta psychiatrica scandinavica*, *67*(6), 361-370.

Zimmermann, P., & Iwanski, A. (2014). Emotion regulation from early adolescence to emerging adulthood and middle adulthood: Age differences, gender differences, and emotion-specific developmental variations. *International journal of behavioral development*, *38*(2), 182-194.

Appendix E – Ethical Approval

SCHOOL of HEALTH IN SOCIAL SCIENCE

The University of Edinburgh
Medical School
Doorway 6, Teviot Place
Edinburgh EH8 9AG

Email ethics.hiss@ed.ac.uk

21 April 2023

Dear **Kelsey Boyle**,

Reference: 22-23CLPS081
Project Title: Perfectionism in Adolescence

Thank you for submitting the above research project for review by the School of Health in Social Science Research Ethics Committee (REC). I can confirm that the submission has been independently reviewed and has received a favourable opinion on 19 April 2023.

The standard conditions of this are:

I. Conduct the project strictly in accordance with the proposal that you have submitted and that has been granted ethics favourable opinion, including any amendments made to the proposal required by the REC.
II. Advise the REC (by email to ethics.hiss@ed.ac.uk) of any complaints or other issues in relation to the project, which may warrant review of the favourable opinion granted to the project.
III. Make submission for approval of amendments to the project before implementing such changes.
IV. Advise in writing if the project has been discontinued.

The School's Research Ethics Policy and further information and resources are available on the School's website.

Best of luck with your project.

Yours sincerely,

Administrative Secretary
School of Health in Social Science