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**Childhood maltreatment, emotional dysregulation and depression
a systematic review**

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Volume I

Systematic Literature Review

Empirical Research Project

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Thesis submitted in partial fulfilment of the degree of Doctorate
in Clinical Psychology

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Childhood maltreatment, emotional dysregulation
and depression: A systematic review

Abstract

The current systematic review aims to understand the relationship between childhood maltreatment, emotional dysregulation and subsequent depression in adulthood. Existing research was identified following a search conducted on relevant scientific databases: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) (1946 to May 2019), Psycinfo (1806 to May 2019), PsycArticles and EMBASE (1974 to May 2019). Further hand searches were also conducted within relevant journals and publications identified from retrieved articles. Publications for the current systematic review were selected in accordance with published PRISMA checklist criteria. Identified publications were then appraised utilising the Quality Assessment Tool for Quantitative Studies measure. Twelve of the thirteen identified studies reported that emotional dysregulation mediates the relationship between childhood maltreatment and subsequent depression in adulthood. Furthermore, there is some evidence to suggest that emotional abuse and neglect may be associated with the highest likelihood of emotional dysregulation, increasing the risk of depression in adulthood. Nevertheless, significant methodological limitations were observed and as such, recommendations for future research are presented.

Introduction

1.1 Childhood maltreatment

The current international definition of childhood maltreatment is: *“All forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child’s health, survival, development or dignity in the context of a relationship of responsibility, trust or power”* (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002; WHO, 1999). Sadly, childhood maltreatment is common and rarely occurs in isolation. Therefore, most maltreated children are likely to be exposed to multiple experiences of abuse and/or neglect concurrently. For example, research indicates that if a child is exposed to physical or sexual abuse, this is very likely to co-occur in the presence of emotional abuse and/or neglect (ten Have, Graaf, van Dorsselaer, Tuithof, Kleinjan, & Penninx, 2019; Stoltenborgh et al, 2012).

In addition to this, the presence of wider adversity has been found to not only increase the risk of a child being maltreated but also to perpetuate the occurrence of the maltreatment. In particular, research indicates that factors such as: severe parental mental health, parental alcohol and/or substance use, poverty, community deprivation, household dysfunction, parental anger, conflict and intra-familial violence are all associated with the presence of maltreatment (Sethi, Bellis, Hughes, Gilbert, Mitis, & Galea, 2013; Butchart, Phinney, Harvey, Kahane, Mian, & Furniss, 2006; Dubowitz, Kim, Black, Weisbart, Semiatin, & Magder, 2011; Euser, van Ijzendoorn, Prinzie, & Bakermans-Kranenburg, 2010; Finkelhor, Turner, Shattuck, & Hamby, 2013; Chan, Brownridge, Fong, Tiwari, Leung, & Ho, 2012; Annerback, Wingren, Svedin, & Gustafsson, 2010; Anda, Butchart, Felitti, & Brown, 2010; van Ijzendoorn, Euser, Prinzie, Juffer, & Bakermans-Kranenburg, 2009; Felitti et al., 1998; Atkinson, Anderson, Hughes, Bellis,

Sumnall, & Syed, 2009; Bellis, Hughes, & Hughes, 2006; Slack et al., 2011). Therefore, maltreated children are likely to be exposed to a range of injurious experiences, which often result in a myriad of negative consequences both in childhood and adulthood.

1.2 Childhood maltreatment and emotional dysregulation

Experiences of maltreatment are thought to have a detrimental impact on the development of key emotional and social processes. In particular, such experiences are thought to disrupt the development of a secure attachment style (Steele, van der Hart, & Nijenhuis, 2001; Main & Hesse, 1990). This in turn is thought to impact the interrelated development of emotional regulation, which also begins in early childhood (Dvir, Ford, Hill, Frazier, 2014; Eisenberg et al, 2010). Such disruptions are likely to result in a more limited repertoire of emotion regulation skills. Furthermore, it is also likely to result in the maladaptive or inappropriate application of any acquired emotion regulation strategies, collectively referred to as emotional dysregulation (Cicchetti, Ackerman, & Izard, 1995).

Many attempts to conceptualise emotional dysregulation have been undertaken but there is no universally accepted definition as yet (Thompson, 2019; D'Agostino, Covanti, Monti, & Starcevic, 2017). Nevertheless, one of the more comprehensive definitions, includes the following dimensions: (1) decreased emotional awareness (the ability to detect and recognise and name an internal emotional experience), (2) inadequate emotional reactivity (a propensity to respond in an inappropriate manner, either exerting too little or too much control, when experiencing intense/overwhelming emotions), (3) intense experience and expression of emotions, (4) emotional rigidity (having a restricted range of emotions or difficulties switching between emotions and having emotional responses that are inappropriate) and (5) impairments in cognitive reappraisals, which refers to the ability to re-evaluate emotions and the meanings attributed to them (D'Agostino, Covanti, Monti, & Starcevic, 2017; Gratz & Roemer, 2004).

Research findings indicate that those with a history of childhood maltreatment are significantly more likely to display emotional dysregulation than those who have not had such experiences. For example, maltreated individuals have been found to be more likely to have: difficulties discriminating between different types of emotional expressions, a bias/increased sensitivity to angry facial expressions, an increased tendency to experience emotions more intensely, increased emotional reactivity, emotional lability, to exert greater regulatory efforts to decrease negative affect and a greater propensity to use maladaptive cognitive strategies such as rumination (McLaughlin, Peverill, Gold, Alves, & Sheriden, 2015; Miller, 2015; Burns, Jackson, & Harding, 2010; Glaser, van Os, Portegijs, & Myin-Germeys, 2006; Heleniak, et al, 2016; Pollak, Cicchetti, Hornung, & Reed, 2000; Michl, McLaughlin, Shepherd, & Nolen-Hoeksema, 2013). This suggests that childhood maltreatment disrupts the normative development of emotional regulation skills, which serves to increase the likelihood of the development of emotional dysregulation.

1.3 Childhood maltreatment and depression

Childhood maltreatment is associated with an increased risk of developing a range of mental health difficulties in adulthood (Norman Byambaa, De, Butchart, Scott, & Vos, 2012). One of the strongest findings to date is that childhood maltreatment is associated with the development, maintenance and recurrence of depressive symptoms (Carr, Martins, Stingel, Lemgruber, & Juruena, 2013; Norman Byambaa, De, Butchart, Scott, & Vos, 2012). More specifically, those who have experienced maltreatment have been found to have an earlier age of onset, greater symptom severity, greater chronicity, greater persistency of symptoms, more comorbidity, are significantly more likely to develop recurrent and/or persistent depressive episodes and be at an increased risk for suicide when compared to those without such a history (Ege, Messias, Thapa, & Krain, 2015; Teicher, & Samson, 2013; Hovens, Giltay, Wiersman, Spinhoven, Penninx, & Zitman,

2012; Nanni, Uher, & Danese, 2012; Rhebergen, et al., 2011; Green et al 2010; Wiersma, et al., 2009; Zlotnick, Mattia, & Zimmerman, 2001; Bernet, & Stein, 1999; Bifulco, et al., 1998). Research also indicates that those with a history of childhood maltreatment are: more likely to drop out of treatment/s, less likely to benefit from treatment/s, more likely to have poorer treatment outcomes, and are also less likely to remit following the completion of treatment/s (Teicher, & Samson, 2013; Nanni, Uher, & Danese, 2012; Fava, 2003; Zlotnick, Mattia, & Zimmerman, 2001; Kaplan, & Klinetob, 2000; Zlotnick, Warshaw, Shea, Keller, 1997; Zlotnick, Ryan, Miller, & Keitner, 1995; Fisher, Winne, & Ley, 1993). In sum, research findings have demonstrated that childhood maltreatment is a significant distal risk factor for a greater illness burden, more chronic course of illness and poorer treatment outcomes for those with a depressive disorder in adulthood. Therefore, this underscores the importance of developing our current understanding of the aetiopathogenesis of depression in those with a history of maltreatment in childhood, which will enable the development of enhanced and targeted prevention, early detection and intervention strategies.

1.4 Childhood maltreatment, emotional dysregulation and depression

Researchers have endeavoured to identify underlying mechanisms that link childhood maltreatment to subsequent depression. To date, a wealth of research has indicated that childhood maltreatment is associated with dysregulated stress-response and inflammatory systems, along with neuroanatomical, functional and epigenetic changes (Heim, Mletzko, Purselle, Musselman, Nemeroff, 2009; Wiersma, Van Oppen, Van Schaik, Van der Does, Beekman, & Penninx, 2011; Liu, 2017; Cattaneo et al, 2015). Parallel efforts have also focused on identifying possible psychological mediators in order to identify targets for therapeutic interventions. These include emotional dysregulation, decreased self-esteem, self-criticism, fear of criticism/rejection, shame, depressogenic attributional styles, negative cognitive styles and insecure attachment

styles (Sachs-Ericsson et al, 2006; Hankin, 2006; O’Dougherty, Wright, Crawford, & Del Castillo, 2009; Goodman & Brand, 2009). Of these, emotional dysregulation has garnered particular interest, as a growing body of research indicates that it is associated with the development and maintenance of a range of psychiatric disorders including depression (Berking, & Wupperman, 2012; Burns, Fischer, Jackson, & Harding, 2012; Rosenthal et al 2015; Brockmeyer et al, 2012; Diedrich, Grant, Hoffman, Hiller, & Berking, 2014; Radovsky, McArdle, Bockting, & Berking, 2014; Joorman & Siemer, 2014). Importantly, evidence indicates that it may be a key mechanism that links childhood maltreatment to depression and other mental health disorders (McLaughlin & Lambert, 2017; Beauchaine, 2015; Kim, & Cicchetti, 2010).

Therefore, it would be beneficial to ascertain whether the relationship between childhood maltreatment and depression is mediated by emotion dysregulation. In addition to this, it would also be helpful to determine whether (1) a particular type of maltreatment is more likely to result in the development of emotion dysregulation serving to increase the subsequent risk of depression or (2) whether a specific combination of types of maltreatment are more likely to result in the development of emotion dysregulation, consequently increasing the risk of depression. Such an enhanced understanding of these relationships would be valuable, as it would inform the development of much needed prevention, early detection and intervention strategies for those who present with depression in the context of historical maltreatment experiences.

1.5 Current systematic review

There are currently no studies that have reviewed the cumulative findings from research investigating the associations between childhood maltreatment, emotional dysregulation and depression. Therefore, the current systematic review will aim to identify, review and appraise existing studies. A summary of the findings of the selected publications will be presented first. This will be followed by an overall discussion section that reviews both

the findings and limitations of extant research. Finally, recommendations for future research will also be presented.

Method

2.1 Search strategy

Searches were conducted on relevant scientific databases: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) (1946 to May 2019), Psycinfo (1806 to May 2019), PsycArticles and EMBASE (1974 to May 2019) using full text and exploded Medical Subject Headings (MeSH) terms to identify relevant studies. Further hand searches were also conducted within relevant journals (e.g. Child Abuse and Neglect) and publications identified from retrieved articles.

The following Medical Subject Headings (MeSH) terms were used with the Boolean operator 'AND' between each set numbered from 1-3:

1) Childhood maltreatment:

Abuse, Aggressive behaviour, Child, Child abuse, Child emotional abuse, Child neglect, Child physical abuse, Child, sexual abuse, Childhood, Childhood neglect, Childhood trauma, Domestic violence, Early, Early experience, Emotional, Emotional abuse, Emotional neglect, Emotional trauma, Experiences, Incest, Maltreatment, Neglect, Physical, Physical abuse, Physical neglect, Sexual and Sexual abuse.

2) Depression:

Depression: Atypical depression, Chronic depression, Depression (emotion), Depressive, Disorder, Dysthymia, Dysthymic disorder, Long term depression, Long-term depression (neuronal), Major depression, Major depressive disorder, Postpartum depression, Recurrent depression, Recurrent depressive disorder, Resistant, Severe depression and Treatment resistant depression.

3) Emotional Dysregulation:

Emotional dysregulation, emotion dysregulation, emotional regulation and emotion regulation.

Publications were included in the review if they met the following criteria:

Inclusion criteria:

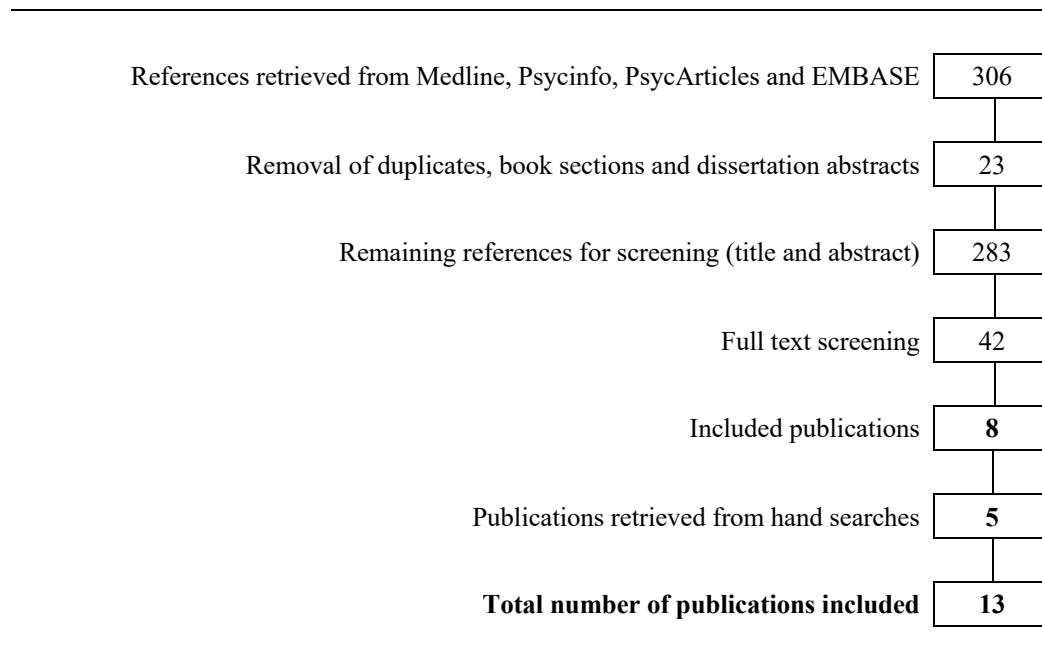
- Peer reviewed publications.
- Studies that investigated whether emotional dysregulation contributes to the development of a depressive disorder or depressive symptoms
- Adults (18 years and above).
- Assessment of the presence of childhood maltreatment, for incidents that occurred prior to 18 years of age.

Exclusion criteria:

- Publications not in the English language.
- Studies that included individuals who had experienced abuse after the age of 18
- Single case studies.
- Dissertation abstracts.
- Book chapters.
- Commentaries/responses/letters.
- Conference abstracts

Based on PRISMA checklist criteria, a total of thirteen studies were identified as meeting inclusion criteria for the current systematic review (PRISMA Group, 2009). See Figure 1 for the PRISMA flow diagram.

Figure 1: PRISMA Flow diagram of study selection



2.1.1 Extracted variables

Once identified, the following information was extracted from each of the thirteen publications: sample population, study design, gender, mean sample age, measure of childhood maltreatment, type of childhood maltreatment investigated, measure of depression, measure of emotion regulation and confounders. These variables were used for the quality assessment process.

2.1.2 Quality assessment of included studies

Selected publications were rated using the Quality Assessment Tool for Quantitative Studies (Effective Public Health Practice Project, 1998). This tool includes the following six categories: selection bias, study design, confounders, blinding, data collection methods and withdrawals and drop-outs. The categories of blinding and withdrawals and drop-outs were excluded, as these were not applicable. Following a process of rating each publication on the four criteria, a global rating score was determined for each of the thirteen studies. Possible overall quality scores included strong, moderate and weak. Please see Appendix A for more detailed information of the rating scale and scores.

Included studies were reviewed by two independent researchers. There were no discrepancies between the reviewers regarding the studies included in the current review. There were, however, some minor discrepancies in the quality scores derived for three of the publications between the two assessors, but this was resolved through discussion.

Results

Thirteen publications were identified as meeting the inclusion criteria for the current review and an overview of the included publications is provided in Table 1. Twelve of the thirteen studies specifically investigated whether emotional dysregulation mediated the relationship between childhood maltreatment and depressive symptoms in adulthood. The findings across these studies were consistent, as they all reported that a history of childhood maltreatment was associated with a higher likelihood of both emotional dysregulation and symptoms of depression. Importantly, all of these studies reported that emotional dysregulation mediated the relationship between the presence of childhood maltreatment and depressive symptoms in adulthood. The final study investigated the extent to which childhood maltreatment and emotional dysregulation explained the variance in depressive symptoms. Findings from this study revealed this relationship in those with depression and Borderline/Emotionally Unstable Personality Disorder traits but not in the smaller sub-sample of individuals diagnosed with only a depressive disorder (Fernando et al, 2014). Overall, the current findings indicate that emotional dysregulation appears to mediate the relationship between childhood maltreatment and subsequent depression in adulthood.

In addition to this, two studies found that emotional abuse was associated with emotional dysregulation and subsequent depression when accounting for all other types of maltreatment (Schulz et al, 2017; Crow et al, 2014). This finding was supported by an additional study, which reported that although emotional abuse was associated with emotional dysregulation and depression, both physical and sexual abuse were not (Christ et al, 2019). A further two studies similarly reported that both emotional abuse and neglect were associated with emotional dysregulation and subsequent depression (O'Mahen et al 2015; Fernando et al, 2014). This suggests that emotional abuse and

neglect, which often co-occur with other forms of maltreatment, may be most likely to result in the development of emotional dysregulation, which in turn increases the risk of depression in adulthood.

3.1 Study design

Following the quality assessment process, eight of the thirteen studies were rated overall as moderate and the remaining five studies were rated overall as methodologically weak (see Appendix A for details of the quality assessment and scores for each of the included thirteen studies). Specifically, twelve of the included studies utilised cross-sectional methodology in combination with retrospective reports of childhood emotional abuse. The remaining study was a longitudinal study that assessed emotional abuse in childhood prospectively up to the age of six years.

3.2 Settings and population

Across these thirteen studies, there was considerable variation in the study settings. In particular, four studies recruited participants from outpatient mental health clinics, one recruited participants from an inpatient mental health service, one study recruited participants from an obstetrics clinic, a further study recruited participants from a primary care clinic, one recruited participants from a specific community, two studies recruited participants from a convenience sample and the final two studies recruited participants using an online survey.

The majority of participants across the thirteen studies were female. Additionally, three of the studies only included female participants (Cloitre et al, 2019; Coates et al, 2014; O'Mahen et al, 2015). In terms of ethnicity, seven of the thirteen studies reported the ethnicity of study participants (Coates et al, 2014; Crow et al, 2014; Raes et al, 2008; Milojevich et al, 2019; Huh et al, 2017; Cloitre et al, 2019; O'Mahen et al, 2015). Furthermore, within these studies, only a minority of participants were from a Black or

other Ethnic Minority background. Finally, Four of the thirteen studies did not report any inclusion or exclusion criteria and the remaining nine studies reported inclusion criteria (e.g. proficiency in the specified language) and exclusion criteria (e.g. bipolar disorder, substance dependence and cognitive impairments) that ranged considerably.

3.3 Measurement of childhood maltreatment, emotional dysregulation and depression

The twelve studies that utilised retrospective measures of childhood maltreatment all utilised self-report measures and ten of these studies utilised the same measure; the Childhood Trauma Questionnaire. The remaining two studies used a checklist and a computerised scale (Coates et al, 2014; Cloitre et al, 2019). The final study that measured childhood maltreatment prospectively used formal child protection records to identify children who had experienced maltreatment up to the age of six years (Milojevich et al, 2019).

Across all of the thirteen studies, emotional dysregulation was measured indirectly, as existing self-report measures only measure emotion regulation. Ten of the included studies utilised instruments that measured emotion regulation more generally. However, the three remaining studies measured specific aspects of emotion regulation, such as rumination and emotion acceptance (Schulz et al, 2017; O'Mahen et al, 2015; Raes et al, 2008).

Four of the thirteen included studies utilised diagnostic interview measures to assess for the presence of depression in adulthood (Schulz et al, 2017; Huh et al, 2017; Hopfinger et al, 2016; O'Mahen et al, 2015). All of the remaining studies utilised validated self-report depression measures.

Table 1: Summary of retrieved publications

Author	Population	CM measure	Depression Measure	Emotion Regulation Measure	Results	Score
Schulz et al, 2017	Psychiatric inpatient N=123 Gender (male): 73 (59.3) Age mean: 40.3	German CTQ	Interview using ICD-10 International diagnosis checklist German version of the BDI-II MADRS (expert-rated scores)	32- item EAQ	A lower capacity to accept pleasant emotions mediates the association between childhood emotional abuse and depressive symptoms after controlling for other types of maltreatment	Moderate
Huh et al, 2017	Psychiatric outpatient N= 585 Gender (male): 268 (45.7) Age mean: 36.9	CTQ	MINI, BDI	CERQ	Those reporting greater childhood maltreatment experiences were more likely to use maladaptive cognitive emotion regulation strategies and this mediated the relationship between early life traumatic experience and current symptoms of depression	Moderate
Cloitre et al, 2019	Secondary analysis mental health clinics N= 290 Gender (male): 0 (0) Age mean: 42.5	18-item LSC-R	6-item depression sub-scale of the BSI	DERS	Emotion regulation difficulties significantly mediated the relationship between early adversity and depression	Moderate
Milojevich et al, 2019	High risk community N= 866 Gender (male): 432 (49.9) Age mean: 18	Child Protective Services records up to age 6 expanded Things I have heard and see scale (child-report) CTS (caregiver to child)	Young adult DISC-IV	ACOPE	Mediation analyses suggest that avoidant regulation may explain why those exposed to higher levels of threat in childhood develop depression	Moderate

Table 1: Summary of retrieved publications (continued)

Hopfinger et al, 2016	<p>Psychotherapy clinic settings N= 269 Gender (male): 121 (44.9) Age mean: 43.51</p>	CTQ	SCID and HRSD-24	ERSQ	<p>Deficits in general emotion regulation partially mediated the association of childhood trauma to both depression severity and depression lifetime persistency</p>	Moderate
Fernando et al, 2014	<p>Psychiatric clinic N= 48 Gender (male): 22 (45.8) Age mean: 33.15</p>	German CTQ	BDI	DERS	<p>In the MDD only subgroup, childhood trauma and emotion regulation difficulties did not explain the variance in depressive symptom. However, in the total sample, which included individuals with Emotionally Unstable Personality Disorder, both were associated with depressive symptoms</p>	Moderate
Schierholz et al, 2016	<p>Clinical sample (data from online survey) N= 340 Gender (male): 60 (17.6) Age mean: 36.1</p>	German CTQ short version	German PHQ-9	DERS	<p>The total indirect effects of severity of childhood maltreatment on the number of depressive episodes and depression severity through scores on the DERS was significant.</p>	Moderate

Table 1: Summary of retrieved publications (continued)

Coates et al, 2014	College sample N= 771 Gender (male): 0 (0) Age mean: 18.78	Computer assisted maltreatment inventory	Depression scale (10-items) of the TSI	DERS	Understanding and experiencing emotions and coping with negative emotions was found to mediate the relationship between childhood psychological abuse and depressive symptoms in emerging adulthood	Moderate
Klumparendt et al, 2019	General population N= 1027 Gender (male): 322 (31.4) Age mean: 45.1	German CTQ	German PHQ-9	German DERS	The relationship between childhood maltreatment and depression symptoms was mediated by Emotional regulation difficulties	Weak
O'Mahen et al, 2015	Pregnant women recruited from obstetric clinics low-income groups N= 140 Gender (male): 0 (0) Age mean: 26.7	CTQ	Only those with a score of 12 or above on the EPDS were invited SCID-I, BDI	RRS (10-item)	Childhood emotional abuse was found to predict rumination (brooding) Brooding partially mediated the association between childhood emotional abuse and depression	Weak
Crow et al, 2014 Grady trauma project	General medical and obstetric N= 3902 Gender (male): 1214 (31.1) Age mean: 39.34	CTQ	BDI	EDS	Emotion dysregulation is one mechanism through which childhood emotional abuse increases risk for depression. There was also some support for a greater role of childhood emotional abuse compared to other childhood trauma types	Weak

Table 1: Summary of retrieved publications (continued)

Raes et al, 2008	College sample N= 101 Gender (male): 18 (17.8) Age mean:19.6	CTQ	BDI	RRS	A sub-type of rumination, brooding, was found to mediate the relationship between Childhood emotional abuse and depressive symptoms	Weak
Christ et al, 2019	College Sample N= 276 Gender (male): 0 (0) Age mean:	CTQ-Short Form	QIDS-SR-16	DERS	Childhood emotional abuse was independently associated with depressive symptoms and emotional dysregulation whereas physical and sexual abuse were not Emotion dysregulation significantly mediated the effect of childhood emotional abuse on depressive symptoms	Weak

CTQ- Childhood Trauma Questionnaire, BDI-II – Beck Depression Inventory, MADRS - Montgomery Asberg Depression Rating Scale, EAQ - Emotion acceptance questionnaire, MINI -The Mini-International Neuropsychiatric Interview , CERQ - The Cognitive Emotion regulation questionnaire, LSC-R - life stressor checklist, BSI - Brief Symptom Inventory, DERS - Difficulties in Emotion Regulation Scale, CTS - Conflict Tactics Scale, DISC-IV -Young Adult Diagnostic Interview Schedule for Children , ACOPE - Adolescent Coping Orientation for Problem Experiences, SCID -Structured Clinical Interview , HRSD-24 - Hamilton Rating Scale for Depression, ERSQ - Emotional Regulations Skills Questionnaire, PHQ -9 – Physical Health Questionnaire, TSI - Trauma Symptom Inventory, EPDS – Edinburgh Postnatal Depression Scale, RRS - Ruminative Response Scale, EDS - Emotion Dysregulation Scale, QIDS-SR-16 - Quick Inventory of Depressive Symptoms.

Discussion

4.1 Summary of findings

The current systematic review identified thirteen studies that investigated the association between childhood maltreatment, emotional dysregulation and depression. Twelve of the thirteen studies reported that a history of childhood maltreatment was associated with a higher likelihood of both emotional dysregulation and symptoms of depression. Crucially, these studies also reported that emotional dysregulation mediated the relationship between the presence of childhood maltreatment and depressive symptoms in adulthood. There were also some initial findings, which suggest that of all the forms of maltreatment, emotional abuse and neglect may increase the risk of both emotional dysregulation and depression the most. These findings are promising, however, research in this field is in its infancy. Therefore, these findings should be interpreted within the context of some key methodological limitations.

4.2 Limitations of current research

4.2.1 Study design

The predominant use, in twelve of the thirteen studies, of cross-sectional methodology in combination with retrospective reports of childhood emotional abuse is a significant limitation of existing research. This is primarily as the use of such an approach does not enable causality or the temporal precedence of the factors under consideration to be established.

Additionally, the range of study settings was extremely varied across the thirteen studies limiting comparability. This range included: an inpatient service, outpatient services, general medical settings, an online database, general population and student settings.

4.2.2 Inclusion and exclusion criteria

Similarly, the possibility of direct comparisons was also limited due to the level of variability across the inclusion and exclusion criteria utilised across the studies. Of note, exclusion criteria were not specified in four of the thirteen included studies. Of the remaining studies, seven did not include individuals reporting a psychotic disorder, six studies excluded individuals reporting mania or bipolar disorder, five excluded individuals reporting substance dependence, four studies excluded individuals at a high risk of suicide and/or self-harm. Two studies excluded individuals with personality disorders. However, one of these reported the use of a non-standardised measure to assess for symptoms of personality disorders (Huh et al, 2017). Finally, a total of five studies excluded individuals presenting with cognitive impairments. Therefore, participants across the thirteen studies are likely to be an extremely heterogeneous group limiting the conclusions that can be made.

Included studies were also limited by a number of demographic factors, which further limited the generalisability of the findings. Specifically, three studies only included female participants and in eight of the remaining studies, the majority of the participants were female. Similarly, only seven of the Thirteen studies reported participant ethnicity and only a minority of participants were identified to be from Black and Ethnic Minorities. Finally, seven of the thirteen studies excluded individuals who were not fluent in the language specified.

4.2.3 Measurement of childhood maltreatment

Significant variations in the types of maltreatment included across the thirteen studies make direct comparisons difficult. Six studies included physical abuse, sexual abuse, emotional abuse, physical neglect and emotional neglect in analyses investigating the association between maltreatment, emotional dysregulation and depression (Huh et al, 2017; Klumparendt et al, 2019; O'Mahen et al, 2015; Hopfinger et al, 2016; Fernando et

al, 2014; Schierholz et al, 2016). One study included physical abuse, sexual abuse, emotional abuse, physical neglect and emotional neglect but combined emotional abuse and emotional neglect (Schulz et al, 2017). A further study investigated physical abuse, sexual abuse, emotional abuse, physical neglect and emotional neglect but only included emotional abuse in analyses (Crow et al, 2014). Another study included only physical, sexual and emotional abuse (Christ et al, 2019). Two studies only investigated emotional abuse and psychological maltreatment (Raes et al, 2008; Coates et al, 2014). The two final studies only investigated physical abuse, sexual abuse and neglect (Cloitre et al, 2019; Milojevich et al, 2019).

In all but one of the included studies, the presence of childhood maltreatment was assessed using retrospective self-report measures. In the one study that assessed maltreatment prospectively, experiences of maltreatment were only measured up to the age of six years and were obtained from formal child protection records. Utilising such an indirect measure in isolation to assess for childhood maltreatment and only including those who had experienced maltreatment up to the age of 6 are likely to have limited the findings from this study.

Of the studies that utilised retrospective measures, one study utilised a computerised scale to assess for the presence of psychological/emotional maltreatment (Coates et al, 2014). A second study utilised a checklist to assess for the presence of physical and sexual abuse and neglect (Cloitre et al, 2019). In the remaining ten studies, the presence of childhood maltreatment was identified using the Childhood Trauma Questionnaire (CTQ). The CTQ is a validated instrument, which is used to retrospectively assess for the presence of childhood maltreatment up to the age of 18 years (Bernstein et al., 2003). Therefore, a majority of the studies utilised self-report measures, which are open to recall bias. Furthermore, self-report measures are reliant upon each individual's interpretation of the questions and their own experiences. Therefore, the severity of the abuse is not

standardised across all participants. The CTQ also does not capture wider contextual information. For example, when the maltreatment began, duration, type or combination of abuse or neglect and severity abuse or neglect. Additionally, it does not capture the presence of factors that may have been protective. Therefore, none of the studies utilised either comprehensive or objective measures to assess for the presence and severity of childhood maltreatment.

4.2.4 Measurement of emotional dysregulation

All of the studies utilised instruments that measure emotional dysregulation indirectly. A reflection of the fact that most existing instruments measure difficulties with emotional regulation (D'Agostino, Covanti, Monti, & Starcevic, 2017). The additional lack of a clear definition of emotional dysregulation has also led to a number of difficulties. In particular, emotional dysregulation encompasses a number of dimensions but existing tools differ in the aspects measured. For example, some measures are restricted to one aspect only whereas others are more generalised. Of the included studies, three only investigated specific, rumination and emotion acceptance, aspects of emotional regulation (Schulz et al, 2017; O'Mahen et al, 2015; Raes et al, 2008). Although the remaining studies utilised more general measures, it is difficult to ascertain whether the different instruments were indeed capturing the same information due to existing definitional inconsistencies. In addition to this, all of the included studies only utilised self-report measures of emotion regulation. Therefore, no objective indicators of emotional processing that have been identified (e.g. cardiac vagal tone) have been utilised in research to date. Therefore, current findings are unlikely to capture the complexity of emotional dysregulation, which includes experiential, physiological and behavioural components. Finally, all of the measures utilised were developed within a western sociocultural context, therefore it is not known whether these are fully applicable within a non-western context. All of these factors serve to limit comparability between studies.

Therefore, it would be beneficial for future research to utilise a broader approach through the combination of a range of subjective and objective indicators that directly measure emotional dysregulation in order to increase the validity of findings.

4.2.5 Measurement of depression or depressive symptoms

Four of the thirteen included studies utilised diagnostic interview measures to assess for the presence of depression in adulthood. All of the remaining studies utilised validated self-report depression measures and aimed to assess this relationship in a dimensional manner, which included those presenting with no depressive symptoms to those presenting with a number of depressive symptoms. Therefore, for these studies, limitations relating to self-report measures remain.

Two out of the thirteen studies only included individuals meeting diagnostic criteria for diagnosis of a major depressive disorder in analyses (Hopfinger et al, 2016, Schulz et al, 2017). A further study included individuals meeting criteria for major depressive disorder and others who were found to have elevated depressive symptoms, as identified by the Edinburgh Postnatal Depression Scale (O'Mahen et al, 2015). Similarly, only four of the included studies included individuals seeking treatment for their depressive symptoms and one study excluded individuals in treatment.

None of the studies reported on whether participants were presenting with new symptoms or a chronic course of illness with multiple depressive episodes or a more dysthymic presentation. Furthermore, only one study queried current or past treatment status. Therefore, the depression status of participants across the thirteen studies is likely to be extremely varied, which does not allow for direct comparisons to be made.

4.2.6 Possible confounders

The thirteen included studies did not consider the potential impact of stressful life events or traumatic experiences in adulthood. This is a limitation of the current findings, as it

inadvertently attributes the current onset of depressive symptoms to experiences that occurred within a specific period and negates the impact of experiences that occurred outside of this period.

None of the symptoms required for a diagnosis of depression are pathognomic of it. Rather, they are symptoms that are associated with a range of both psychiatric and physical health conditions. None of the thirteen studies considered the physical health status of participants although a number excluded individuals based on the presence of other psychiatric disorders.

Finally, emotional dysregulation has a considerable impact on interpersonal interactions. However, none of the included studies considered the presence and quality of social support available to participants, attachment styles or included any aspects of interpersonal interactions. Instead, the studies focused solely on individual self-report. Therefore, a number of factors that are likely to have an important influence were neither identified nor measured in any of the included studies.

4.3 Recommendations for future research

It would be beneficial for prospective studies to be conducted in the future, as this will enable causality and temporal precedence to be established more clearly. It is also crucial for future studies to utilise consistent inclusion and exclusion criteria to decrease heterogeneity and enable direct comparisons to be made across studies. Furthermore, existing research has largely utilised a convenience sampling approach, which limits comparability, clarity and generalisability. Therefore, it would be important to conduct studies within more representative samples.

Future research should also endeavour to control for possible confounding factors, where possible. For example, demographic factors such as age and gender and non-maltreatment related traumatic experiences in childhood, stressful life events, traumatic experiences in

adulthood and physical health status. Similarly, accounting for an individual's attachment style and levels of social support would also increase the validity of future research. Finally, utilising a lifespan approach would be advantageous, as it would enable more nuanced analyses to be conducted, as the impact of both childhood and adulthood experiences and important contextual factors could be considered simultaneously.

It would be important for future studies to utilise more comprehensive measures of maltreatment and ideally obtain information from multiple sources to increase the validity of findings. For prospective studies, this could involve parent and child reports in combination with reports from school and, if appropriate, records from child protection services. For retrospective studies, this could involve the use of comprehensive interview measures such as the Childhood Experiences of Care and Abuse (CECA), which obtain information about the different types of maltreatment along with wider contextual information (Bifulco, 2007). An additional benefit of using such a comprehensive measure is that it is interview rated and scored in accordance with published guidelines. This ensures that all reported experiences are standardised across the study sample, enhancing reliability.

Investigating differences between those who have experienced childhood maltreatment but subsequently not developed depression and those who have developed depressive symptoms would be a valuable addition to the field, as it would help identify factors that either increase vulnerability to depression or conversely increase resilience.

For the measurement of the presence of depression validated interview measures could be utilised together with validated self-report measures to identify symptoms at both a categorical and dimensional level. Furthermore, assessing length of depressive illness, illness severity, treatment/s provided and responses to treatments in conjunction with investigations for the presence of physical health conditions and comorbid psychiatric diagnoses using validated instruments would be beneficial. Primarily, as it will enable

researchers to obtain a more comprehensive understanding of the relationship between childhood maltreatment, emotional dysregulation and depression.

It is essential that future studies identify a clear definition of emotional dysregulation with well-defined dimensions. This would enable the development of measures that capture emotion dysregulation directly. Such an approach would serve to unify research in this field and allow for more direct comparisons of findings. Finally, the addition of objective measures of emotional processing and the inclusion of factors associated with social functioning would substantially strengthen findings.

Conclusions

The aim of the current review was to ascertain the relationship between childhood maltreatment, emotional dysregulation and depression. All but one of the included studies reported that the relationship between childhood maltreatment and depression is mediated by emotional dysregulation. Findings also indicate that emotional abuse and neglect may be associated with a particularly higher likelihood of emotional dysregulation, which consequently increases the risk of depression. Research in this field is in its initial stages, however, so has significant limitations. Therefore, the development of a clear and consistent definition of emotional dysregulation and instruments that measure this directly are fundamental requisites for progress to be made. In sum, although limited, current research is promising and has the potential to lead to significant clinical advances in the prevention and treatment of depression in those with a history of maltreatment.

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Appendix I – Quality Assessment Scores Table

Table 2: Quality Assessment Scores

Author		Selection bias	Study design	Confounders	Data Collection	Score
Huh et al, 2017	Characteristics:	Clinic patients	Cross-sectional	Age, gender and number of years in education	Validated measures	Moderate
	Score:	Moderate	Weak	Moderate	Strong	
Cloitre et al, 2019 Secondary analysis	Characteristics:	Secondary analysis Clinic population and female only	Cross-sectional	Not reported	Validated measures	Moderate
	Score:	Moderate	Moderate	Weak	Strong	
Schulz et al, 2017	Characteristics:	Psychiatric inpatient population	Cross-sectional	Gender, employment status, education level, depression severity	Validated measures	Moderate
	Score:	Moderate	Weak	Moderate	Strong	
Klumpparendt et al, 2019	Characteristics:	Online survey	Cross-sectional	No confounders included	Validated measures	Moderate
	Score:	Moderate	Weak	Weak	Strong	

Table 2: Quality Assessment Scores (continued)

Milojevich et al, 2019	Characteristics:	Low SES population	Longitudinal cohort observation	Gender, ethnicity, family income	Validated measures	Moderate
	Score:	Moderate	Moderate	Moderate	Moderate	
O'Mahen et al, 2015	Characteristics:	Obstetric clinic population	Cross-sectional	Not reported	Validated measures	Moderate
	Score:	Moderate	Weak	Weak	Strong	
Hopfinger et al, 2016	Characteristics:	Psychiatric clinic population	Cross-sectional	Age	Validated measures	Moderate
	Score:	Moderate	Weak	Moderate	Strong	
Fernando et al, 2014	Characteristics:	Psychiatric clinic and community sample	Cross-sectional	Age and gender	Validated measures	Moderate
	Score:	Moderate	Weak	Moderate	Strong	
Schierholz et al, 2016	Characteristics:	Web-based survey	Cross-sectional	Age and gender	Validated measures	Moderate
	Score:	Moderate	Weak	Moderate	Strong	

Table 2: Quality Assessment Scores (continued)

Coates et al, 2014	Characteristics:	Female convenience sample	Cross-sectional	No differences between sub-samples	Validated measures but some limitations	Moderate
	Score:	Moderate	Weak	Moderate	Moderate	
Crow et al, 2014 Grady trauma project	Characteristics:	Primary care clinic population	Cross-sectional	Not reported	Validated measures	Moderate
	Score:	Moderate	Weak	Weak	Strong	
Raes et al, 2008	Characteristics:	Convenience sample	Cross-sectional	Not reported	Two validated measures	Moderate
	Score:	Moderate	Weak	Weak	Moderate	

Childhood emotional abuse: pathways to self-
injurious behaviours in early adulthood

Abstract

Accumulating evidence indicates that emotional abuse is associated with the highest risk of subsequent depression, substance use/abuse and self-injurious behaviours. Self-injurious behaviours, including suicidal behaviours, are most commonly reported in early adulthood. Therefore, an enhanced understanding of how childhood emotional abuse increases this risk in early adulthood would help identify those most at risk, the most effective points at which to intervene and, in doing so, inform the development of more targeted preventative and intervention strategies.

The current study aimed to identify possible pathways from childhood emotional abuse to depression, substance use and subsequent self-injurious behaviours. For this, data from the Avon Longitudinal Study of Parents and Children (ALSPAC) study, which is a longitudinal cohort study, was utilised. Complete data was available for a total of 1405 individuals. The absence or presence of childhood emotional abuse was measured prospectively through parent report. The absence or presence of depression at age 18, substance use at age 18 and self-injurious behaviours, at ages 20 and between 22-23 years, were identified through self-report questionnaires.

The current findings identified that childhood emotional abuse independently increases the risk of non-suicidal self-injurious behaviours at age 20 (Adj. Odds Ratio (OR) = 1.55, 95% BCa CI 0.04 – 0.79, $p = .016$) and of a suicide attempt between the age of 22-23 years (Adj. OR = 4.09, 95% BCa CI 0.56 – 2.19, $p = .002$).

Pathway analyses revealed that childhood emotional abuse acts directly (bootstrapped standardised estimate 0.46, $p = 0.011$) to significantly increase the risk of a suicide attempt between the age of 22-23 years. Emotional abuse was also found to increase the risk of depression and substance use at age 18 and in doing so indirectly increase the risk

of an individual engaging in non-suicidal self-injurious behaviours at age 20 (bootstrapped standardised estimate 0.16, $p = 0.001$ and 0.08, $p = 0.009$ respectively). Finally, the risk of engaging in suicidal behaviours in early adulthood appears to be the most elevated for those who have experienced childhood emotional abuse, reported depression at age 18 and subsequently reported non-suicidal self-injurious behaviours at age 20.

The current findings underscore the importance of assessing for the presence of childhood emotional abuse in young adults presenting with psychopathology, as these individuals are likely to be at an elevated risk of engaging in lethal self-injurious behaviours in the future. The findings also highlight the need for future research to identify key underlying mechanisms, such as emotion dysregulation and insecure attachments, which would inform the development of more targeted clinical interventions. Crucially, however, the current findings highlight the importance of developing wider public health initiatives to reduce the incidence of emotional abuse in order to prevent the potentially devastating consequences such experiences can have.

Introduction

Historically, emotional abuse has received considerably less attention across social, political, academic and clinical spheres than either physical or sexual abuse (Egeland, 2009; Kaplan, Pelcovitz, & Labruna, 1999; Trickett, Mennen, Kim, & Sang, 2009). Recent research, however, has found that emotional abuse can occur in isolation but frequently co-occurs with all other forms of maltreatment (Taillieu, Brownridge, Sareen, & Afifi, 2016; Vachon, Krueger, Rogosch, & Cicchetti, 2015; Bruce, Heimberg, Blanco, Schneier, & Liebowitz, 2012; Bifulco, Moran, Baines, Bunn, & Stanford, 2002). However, it is much rarer for other forms of maltreatment to occur in the absence of emotional abuse (Chamberland, Fallon, Black, & Trocmé, 2011). There is also evidence to suggest that when emotional abuse co-occurs with either physical or sexual abuse, the additive increase in unfavourable outcomes is significantly greater than when other types of abuse are considered together (Spinazzola, et al, 2014). Therefore, it has been proposed that emotional abuse may be a core component underlying all forms of maltreatment and that it leads to equivalent, if not greater, adverse consequences than any other type of abuse (Taillieu, Brownridge, Sareen, & Afifi, 2016; Vachon, Krueger, Rogosch, & Cicchetti, 2015; Rosenkrantz, Muller, & Henderson, 2012; Chamberland, Fallon, Black, Nico, & Chabot, 2012).

A history of childhood emotional abuse has been found to be associated with numerous deleterious consequences in adulthood. For example, accumulating evidence indicates that childhood emotional abuse may be a more significant risk factor for the development of psychopathology than either physical or sexual abuse (Liu, 2017; Nelson, Klumpp, Doebler, & Ehring, 2017; Vachon, Krueger, Rogosch & Cicchetti, 2015; Norman Byambaa, De, Butchart, Scott, & Vos, 2012). Furthermore, childhood emotional

abuse is also associated with a significantly increased risk of developing personality disorders (ten Have, Graaf, van Dorsselaer, Tuithof, Kleinjan, & Penninx, 2019). There is also strong evidence indicating that emotional abuse significantly increases the risk of subsequent self-injurious behaviours (Norman Byambaa, De, Butchart, Scott, & Vos, 2012). Crucially, recent findings indicate that, of all of the different forms of maltreatment, emotional abuse is associated with the highest risk of both non-suicidal and suicidal self-injurious behaviours (Liu, Scopelliti, Pittman, & Zamora, 2018; Salokangas, Luutonen, Heinimaa, From, & Hietala, 2019).

Self-injurious behaviours and in particular suicide, are a major public health concern, particularly as suicide is now the second leading cause of death in young adults aged between 15-29 (WHO, 2014; Bachman, 2018; Turecki, & Brent, 2016). A substantial body of research has demonstrated that depression, substance use/abuse and non-suicidal self-injury are factors that are most likely to increase the risk of future lethal self-injurious behaviours (Ferrari et al, 2010; Asarnow et al, 2011; Ribeiro et al, 2016; Wilkinson, Kelvin, Roberts, Dubicka, & Goodyer, 2011; Nock et al 2013). Notably, childhood emotional abuse independently increases the risk for all of these factors, as evidenced above. Therefore, an enhanced understanding of how childhood emotional abuse may increase the subsequent risk of self-injurious behaviours in early adulthood would be extremely beneficial. Specifically, as this would help identify those most at risk, the most effective points at which to intervene and, in doing so, inform the development of more targeted preventative and intervention strategies. However, there are no studies that have investigated this to date. Therefore, the current study will aim to identify possible, direct and/or indirect, pathways from childhood emotional abuse to self-injurious behaviours that may exist.

The subsequent sections will provide some initial context for the current study by reviewing prevalence rates of childhood emotional abuse, factors commonly associated with the occurrence of emotional abuse in childhood and review key developmental and mental health implications of exposure to childhood emotional abuse. This will be followed by a brief review of the associations between childhood emotional abuse and depression, substance use and self-injurious behaviours. Finally, a description of the motivation, primary aims, and hypotheses of the current study will be provided.

1.1 Definition of childhood emotional abuse

Childhood emotional abuse or psychological abuse is a subtype of childhood maltreatment. There are varying definitions of childhood emotional abuse, but within the United Kingdom, the formal definition of childhood emotional abuse is similar across England, Scotland, Wales and Northern Ireland. In England, emotional abuse is defined as: *“The persistent emotional maltreatment of a child such as to cause severe and persistent adverse effects on the child’s emotional development. It may involve conveying to a child that they are worthless or unloved, inadequate, or valued only insofar as they meet the needs of another person. It may include not giving the child opportunities to express their views, deliberately silencing them or ‘making fun’ of what they say or how they communicate. It may feature age or developmentally inappropriate expectations being imposed on children. These may include interactions that are beyond a child’s developmental capability, as well as overprotection and limitation of exploration and learning, or preventing the child participating in normal social interaction. It may involve seeing or hearing the ill-treatment of another. It may involve serious bullying (including cyber bullying), causing children frequently to feel frightened or in danger, or the exploitation or corruption of children.”* (HM Government, 2015). This is a comprehensive definition that includes a wide range of acts of commission and acts of

omission that are either intended or unintended. This definition is similar to the prevailing international definition stipulated by the World Health Organization (WHO), which also asserts that emotional abuse includes the restriction of a child's movement; patterns of belittling, blaming, threatening, frightening, discriminating against or ridiculing; and other non-physical forms of rejection or hostile treatment at the hands of a parent or caregiver (Butchart, Phinney, Harvey, Kahane, Mian, & Furniss, 2006).

1.2 Prevalence of childhood emotional abuse

A review of a series of meta-analyses which combined and compared the results of 244 publications investigating the prevalence rates for childhood sexual, physical, and emotional abuse along with physical and emotional neglect across continents revealed that the global lifetime prevalence estimate of childhood emotional abuse is 36.3% (Stoltenborgh, Bakermans-Kranenburg, Alink, & van IJzendoorn, 2015). This makes it the most common form of childhood maltreatment (WHO, 2014). A recent systematic review also found that median rates of emotional abuse were nearly double for girls compared to boys in Europe (12.9% vs 6.2% respectively) and North America (28.4% vs 13.8% respectively). Interestingly, prevalence rates are thought to be largely similar across gender groups across the rest of the world (Moody, Cannings-John, Hood, Kemp, & Robling, 2018).

Within the United Kingdom, however, 2018 estimates indicated that emotional abuse was the second most commonly reported form of maltreatment, after neglect, (Bentley et al, 2018). A review of long-term trends within England and Wales also revealed that child protection registrations for neglect and emotional abuse have increased over time (Degli-Esposti et al, 2019). A finding which, in part, is likely to be due to an increased awareness and consequent identification of emotion abuse over the past decade or so.

1.3 Factors associated with childhood emotional abuse

Given the limited research on childhood emotional abuse, to date, it is not possible to state conclusively whether there are specific factors that solely increase the risk of emotional abuse. Nevertheless, a diverse range of factors that have been found to elevate the risk of a child experiencing one or more type of maltreatment have been identified. Key factors include: low socioeconomic status, community deprivation, parental substance and/or alcohol abuse, severe parental mental illness, lower parental educational achievement, poverty, younger parental age, conflict and intra-familial violence (Sethi, Bellis, Hughes, Gilbert, Mitis, & Galea, 2013; Butchart, Phinney, Harvey, Kahane, Mian, & Furniss, 2006; Dubowitz, Kim, Black, Weisbart, Semiatin, & Magder, 2011; Euser, van Ijzendoorn, Prinzie, & Bakermans-Kranenburg, 2010; Finkelhor, Turner, Shattuck, & Hamby, 2013; Chan, Brownridge, Fong, Tiwari, Leung, & Ho, 2012; Annerback, Wingren, Svedin, & Gustafsson, 2010; Anda, Butchart, Felitti, & Brown, 2010; van Ijzendoorn, Euser, Prinzie, Juffer, & Bakermans-Kranenburg, 2009; Felitti et al., 1998; Atkinson, Anderson, Hughes, Bellis, Sumnall, & Syed, 2009; Bellis, Hughes, & Hughes, 2006; Slack et al., 2011).

1.4 Adverse outcomes associated with childhood emotional abuse

Emotional abuse, as defined above, encompasses a range of injurious acts. Owing to this, the nature of the act/s meted out are likely to influence the ensuing impact this has on a child, which could result in a range of adverse outcomes. Nevertheless, what remains consistent is that such abusive acts compromise the normative development of critical emotional and social processes, resulting in the development of attachment, emotional regulation and behavioural difficulties (Cicchetti, Rogosch & Toth, 2006; Cyr et al, 2010;

Spinazzola, et al, 2014; Burns, Jackson, & Harding, 2010; Banducci, Hoffman, Lejuez & Koenen, 2014).

Research also indicates that these difficulties persist into adolescence and beyond (Braithwaite, Connor, Degli-Esposti, Luke, & Bowes, 2017). Furthermore, across adolescence these difficulties are often accompanied by maladaptive coping strategies (McLaughlin, Hatzenbuehler, Mennin, Nolen-Hoeksema, 2011; Althoff, Verhulst, Rettew, Hudziak, van der Ende, 2010; Mezquita, Ibanez, Moya, Villa, & Ortet, 2014; Anderson & Teicher, 2008; 2009; Khoury, Tang, Bradley, Cubells & Ressler, 2010; Mandavia, Robinson, Bradley, Ressler, & Powers, 2016; Khantzian, 1997; 1985; Norman Byambaa, De, Butchart, Scott, & Vos, 2012). These findings indicate that emotional abuse in childhood initiates a negative developmental cascade that appears to ripple throughout the life course (Cicchetti, 2013).

Indeed, research supports this, as findings have consistently demonstrated that a history of childhood emotional abuse significantly increases the risk of psychopathology and personality disorders in adulthood (ten Have, Graaf, van Dorsselaer, Tuithof, Kleinjan, & Penninx, 2019; Cecil, Viding, Fearon, Glaser, & McCrory, 2017; Waxman, Fenton, Skodol, Grant, & Hasin, 2014; Afifi et al, 2011; Lobbestael, Arntz, & Bernstein, 2010; Taillieu, Brownridge, Sareen, & Afifi, 2016). Of importance, a consistent dose-response relationship with repeated, frequent or severe abuse has also been reported for psychopathology and emotional abuse (Jewkes, Dunkle, Nduna, Jama, Puren, 2010; Hovens, Wiersma Giltay, van Oppen, Spinhoven, et al. 2010).

1.4.1 Childhood emotional abuse and depression

Research to date has demonstrated that childhood emotional abuse confers the highest risk for depression, in adulthood, more so than either physical or sexual abuse (Taillieu,

Brownridge, Sareen, & Afifi, 2016; Christ et al, 2019; Gerke, et al, 2018; Gibbs, Chelminski, & Zimmerman, 2007; Mandelli, Petrelli, & Serretti, 2015; Norman Byambaa, De, Butchart, Scott, & Vos, 2012). Moreover, a history of childhood emotional abuse is also associated with an earlier onset, a more chronic course of illness and a higher likelihood of treatment-resistance (Nelson, Klumpp, Doebler, & Ehring, 2017; Hovens, Giltay, Wiersman, Spinhoven, Penninx, & Zitman, 2012).

1.4.2 Childhood emotional abuse and substance use

Childhood emotional abuse significantly increases the odds of substance use disorders over and above any other type of abuse (Taillieu, Brownridge, Sareen, & Afifi, 2016; Mandavia, Robinson, Bradley, Ressler, & Powers, 2016; Norman Byambaa, De, Butchart, Scott, & Vos, 2012). Furthermore, emotional abuse has also been found to be associated with an earlier age at initiation of substance use and greater severity of substance use (Khoury, Tang, Bradley, Cubells, & Ressler, 2010; Scheidell et al, 2018). In turn, these factors also collectively increase the risk of an individual subsequently developing a substance use disorder (Turner, Mota, Bolton, & Sareen, 2018).

1.4.3 Childhood emotional abuse and self-injurious behaviours

Self-injurious behaviours include both non-suicidal self-injurious behaviours and suicidal behaviours. Briefly, non-suicidal self-injury involves the deliberate damage or destruction of one's own bodily tissue in the absence of suicidal intent (Nock, 2010). This most commonly includes one or more of the following: hitting, scratching, cutting or burning oneself (Muehlenkamp, & Gutierrez, 2004). It is believed that individuals who engage in non-suicidal self-injury often do so in order to regulate their emotions, communicate distress or as a means of self-punishment (Taylor, Jomar, Dhingra, Forrester, Shahmalak, & Dickson, 2017). This suggests that the fundamental aim of non-

suicidal self-injury is to modify consciousness and not to terminate it (Hamza, Stewart, & Willoughby, 2012). In contrast, suicidal behaviours, such as a suicide attempt, are associated with an intention to terminate consciousness. Therefore, methods that have a high level of lethality such as, poisoning, hanging or drowning are more likely to be utilised (Bachman, 2018).

A recent comprehensive meta-analysis revealed that although all forms of maltreatment are associated with non-suicidal self-injury, emotional abuse was found to have the strongest effect (Liu, Scopelliti, Pittman, & Zamora, 2018). Similarly, a study that investigated the impact of neglect, physical, sexual and emotional abuse in childhood on suicide risk, within a clinical population, found that emotional abuse was the only type of abuse to be independently associated with a risk of suicide (Salokangas, Luutonen, Heinimaa, From, & Hietala, 2019). Taken together, these findings are highly suggestive of the fact that the pathogenic effect of emotional abuse is likely to be greater than that of any other type of abuse.

1.5 Motivation for the current study

As evidenced above, emotional abuse significantly increases the risk of depression, substance use and self-injurious behaviours. However, depression is a well-known risk factor for self-injurious behaviours (Bachman, 2018; Turecki, & Brent, 2016; WHO, 2014; Bradvik, 2018). Similarly, substance use is also associated with an increased risk of self-injurious behaviours (Bachman, 2018; Turecki, & Brent, 2016; Carmel, Ries, West, Bumgardner, & Roy-Byrne, 2016; WHO, 2014; Bradvik, 2018). Finally, non-suicidal self-injurious behaviours have also been found to be a robust predictor of future more lethal self-injurious behaviours such as suicide attempts (Asarnow et al, 2011; Ribeiro et al, 2016; Wilkinson, Kelvin, Roberts, Dubicka, & Goodyer, 2011; Kiekens et

al, 2018). Despite this, as yet, it is not clear who may be most at risk for engaging in non-suicidal self-injurious behaviours in early adulthood. Equally, it is not clear who may be at a greater risk of transitioning from engaging in non-suicidal self-injury to more dangerous and consequently life-threatening behaviours.

This lack of clarity is primarily because most existing studies have tended to investigate these factors in isolation rather than in combination. Further limitations of extant research include the predominant use of cross-sectional methodology in combination with retrospective reports of childhood emotional abuse. This approach is informative, as it enables the identification of key risk factors. However, such an approach does not allow for the identification of specific pathways to self-injurious behaviours. Additionally, it is not possible to gain insights in to the temporal precedence of identified risk factors with such an approach. A final limitation of existing research is the use of non-representative samples, which limits generalisability. Therefore, the current study hopes to add to the field by addressing the limitations identified above through the use of prospective longitudinal methodology within a general population sample.

1.6 Primary aims of the study

The current study aims to initially identify whether a history of childhood emotional abuse directly increases the likelihood of (1) depression and/or (2) substance use at age 18, non-suicidal self-injury at age 20 and a suicide attempt between 22-23 years. Following this, the study will aim to ascertain whether (1) depression and/or (2) substance use at age 18 in those who have a history of childhood emotional abuse additively increase the risk of future self-injurious behaviours. The study will then aim to identify whether individuals with a history of emotional abuse who report non-suicidal self-injurious behaviours at age 20 are at a significantly higher risk of transitioning to riskier and more

lethal behaviours between the age of 22 – 23 years. Finally, the study will also aim to identify which of these factors or combination of factors, when considered simultaneously, are the strongest predictors of self-injurious behaviours in early adulthood.

1.6.1 Primary study hypotheses

- 1. Individuals who have experienced emotional abuse in childhood will be more likely to engage in self-injurious behaviours in early adulthood*
- 2. The presence of depression at age 18, in the context of childhood emotional abuse, will increase the risk of an individual subsequently engaging in self-injurious behaviours in early adulthood*
- 3. The presence of substance use at age 18, in the context of childhood emotional abuse, will increase the risk of an individual subsequently engaging in self-injurious behaviours in early adulthood*
- 4. The presence of non-suicidal self-injury at age 20, in the context of childhood emotional abuse, will increase the risk of an individual reporting a suicide attempt by age 23*

Method

2.1 Study design

2.1.1 The Avon Longitudinal Study of Parents and Children (ALSPAC)

Data for the current study was obtained from the Avon Longitudinal Study of Parents and Children (ALSPAC) dataset. ALSPAC is an ongoing longitudinal birth-cohort study that aims to understand the relationship between environmental and biological risk factors and health and development in children and parents. Pregnant women resident in the Avon region, of the United Kingdom, with expected dates of delivery between April 1, 1991, and December 31, 1992, were invited to participate in the study. A total of 14,541 women did, and of these initial pregnancies, there were a total of 14,676 fetuses. This resulted in 14,062 live births and 13,988 children who were alive at 12 months (Fraser et al, 2013). Additional recruitment increased the total number of pregnancies to 15,247, resulting in 14,775 live births, and 14,701 children alive at 12 months (Boyd et al., 2013; Fraser et al., 2013). A comparison of the ALSPAC cohort with 1991 National Census Data has revealed that, at the start of recruitment, the ALPSAC sample was broadly similar to that of the general population of the United Kingdom (Boyd et al, 2013). The primary differences observed were that the ALSPAC sample has a smaller proportion of mothers from a Black and Minority Ethnic groups, based on the geographical location (4.1 % vs. 7.6 %), a higher proportion of married or co-habiting mothers and a greater number of owner-occupier families (Boyd et al. 2013). The ALSPAC study website contains details of all available data through a fully searchable data dictionary and variable selection tool (<http://www.bristol.ac.uk/alspac/researchers/our-data/>).

2.1.2 Current study

The current study was linked to a larger study that utilised a specific subset of the ALSPAC variables. Therefore, this study did not have full access to the existing ALSPAC dataset.

In addition to this, significant participant attrition was observed in the more recent phases of the ALSPAC study. Therefore, for a significant number of participants, no data was available at ages 18, 20 and 23. However, complete data from a total of 1405 individuals, which is 9.4% of the full ALSPAC sample was available for the current analyses. This sub-sample includes a total of 1198 (85.27%) individuals who did not experience any emotional abuse from birth up to the age of 12.5 years and 207 (14.73%) individuals who were reported to have experienced emotional abuse from birth up to the age of 12.5 years.

2.2 Ethical approval

Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee (see <http://www.alspac.bris.ac.uk>). Ethical approval for the current study was also obtained from the Psychiatry, Nursing and Midwifery Research Ethics Committee, King's College London (Reference: LRS-18/19-11985). See Appendix I for approval documents.

2.2.1 Informed consent

During the course of the childhood phases of the ALSPAC study, written informed consent was obtained from a primary caregiver and written informed assent was obtained from the child. Written informed consent was subsequently obtained directly from the ALSPAC study child at the age of 18 years.

2.2.2 Specific ethical considerations

Emotional abuse, during childhood, was primarily assessed through questionnaire measures completed by the child's caregiver/s. Due to the nature of the information being requested, all participants were informed that any responses relating to caregiver emotional abuse would be anonymised, remain confidential and be used only for the purposes of academic research.

2.2.3 Data handling and record keeping

Data has been handled in accordance with the ALSPAC Data User Responsibilities Agreement. Please see Appendix II for documentation.

2.3 Study measures

2.3.1 Childhood emotional abuse

2.3.1.1 Identifying childhood emotional abuse variables

To identify variables that would capture experiences of emotional abuse as accurately as possible, search terms were derived from two validated childhood maltreatment measures. Namely, the Childhood Trauma Questionnaire (CTQ) and the Childhood Experiences of Care and Abuse measure (CECA), which is a semi-structured interview measure (Bernstein et al., 1998;2003; Bifulco, 2007).

Once the search terms were identified (e.g. emotional, abuse, hurtful, insulting, cruel) from the two validated measures, these terms were then used to identify possible variables that captured childhood emotional abuse across the subset of the ALSPAC dataset that was available for the purposes of the current analyses. Following this, a total of 21 variables across eight time-points were identified as capturing possible experiences of emotional abuse. These retrieved variables were then cross-referenced with a list of

existing emotional abuse variables within the ALSPAC dataset (Houtepan, Heron, Suderman, Tilling, & Howe, 2018).

All variables were developed by the ALSPAC team and were embedded within a wider self-report questionnaire measure. The questions included in the questionnaires aimed to identify whether the maternal caregiver/s was emotionally cruel to the study child and whether the maternal caregiver believed that the paternal caregiver was emotionally cruel to the study child. The same questions were also posed to the paternal caregiver/s (see Appendix III for the list of variables). Based on the available data, agreement between maternal self-report and paternal report regarding whether the maternal figure was emotionally cruel to the study child was high at 98.3%. Similarly, agreement between paternal self-report and maternal report regarding whether the paternal figure was emotionally cruel to the study child was also high at 98.6%.

Of importance, two key factors in conjunction are likely to have impacted the validity of the assessment of childhood emotional abuse within the ALSPAC study. First, the presence of childhood emotional abuse was not assessed using either a validated and/or objective measure. Second, the use of caregiver reports on the presence of childhood emotional abuse may have led to an underestimation of study children who were exposed to childhood emotional abuse. These limitations will be reviewed in detail in the discussion section of this thesis.

2.3.1.2 Scoring of identified variables

Of the 21 identified variables, eight were binary (e.g. ‘Yes’ vs. ‘No’). Therefore, a response of “*yes, this happened*” was scored as a 1 denoting the presence of abuse at this timepoint and a response of “*No, did not happen*” was scored as a 0 denoting an absence of emotional abuse at this timepoint. For the remaining variables that had multiple

responses, all responses that were positive for emotional abuse were collapsed together. For example, for the following question: “*Respondent’s partner was emotionally cruel to children since study child’s 5th birthday*” the following responses were collapsed and scored as a 1 denoting the presence of emotional abuse: “*Yes & affected respondent a lot*”, “*Yes, moderately affected*”, “*Yes, mildly affected*” and “*Yes, not affected*”. The response of “*No, did not happen*” was scored as a 0 denoting an absence of emotional abuse at this timepoint. Therefore, for the purposes of the current analyses, only responses confirming a complete absence of emotional abuse were scored as an absence of childhood emotional abuse. This was in order to minimise the possibility of individuals who may have experienced emotional abuse inadvertently being categorised as not having experienced emotional abuse. Finally, a derived variable of presence of emotional abuse vs. absence of emotional abuse from birth up to the age of 12.5 years was created. A score of 1 denoted the presence of one or more experience of emotional abuse and a score of 0 denoted an absence of such experiences up to the age of 12.5 years.

2.3.2 Demographic covariates

Gender: A score of 1 indicates male and a score of 0 indicates female.

Ethnicity: A score of 1 indicates those who self-identified as White and a score of 0 indicates those who self-identified as Non-White.

Family social class: Both maternal and paternal social class scores were based on the individual’s occupation status, which included the following categories, scored as follows: 1 = Professional, 2 = Managerial and technical, 3 = Skilled non-manual, 4 = Skilled manual, 5 = Partly skilled and 6 = Unskilled. The highest social class recorded for each family unit was used for the current analyses.

2.3.3 Risk factors associated with childhood maltreatment

A number of factors such as; younger parental age, lower levels of education, single parent households, parental mental health and parental substance use have been found to be associated with an increased likelihood of childhood maltreatment (Butchart, Phinney, Harvey, Kahane, Mian, & Furniss, 2006). Therefore, a risk score that ranged between 0-11 was created by summing responses from the following variables:

1. Parental age

If a mother reported her age as being 19 years or below at the time of the study child's birth, a score of 1 was recorded. For those who reported being 20 years or older at the time of the study child's birth, a score of 0 was recorded. The same scoring method was applied for responses obtained from the father.

2. Single parent household

If a mother reported not cohabiting with a partner or not having a partner when the study child was 8 months old, a score of 1 was recorded and if a mother reported cohabiting with a partner/husband when the study child was 8 months, a score of 0 was recorded.

3. Parental highest education level

If the study child's mother's recorded highest educational qualification was either a vocational qualification or a GCSE/CSE level or equivalent, a score of 1 was recorded, if it was at or equivalent to an Advanced level (A/L) qualification a score of 2 was recorded and if it was at the level of a degree or higher, a score of 3 was recorded. The same scoring method was applied for responses obtained from the father.

4. Edinburgh Post-Natal Depression Scores

Both maternal and paternal total scores on the Edinburgh Post-Natal Depression Score measure at 8 months were used. On this measure, scores range from 0-29 and a score of 13 and above is thought to be indicative of depression. Therefore, scores between 13-29 were scored as a 1 and scores between 0-12 were scored as a 0.

5. Parental mental health admissions

If a mother reported that she had been admitted to hospital for a mental health disorder up until her child was 20 years old, this response was scored as a 1. For those who reported no hospital admissions for a mental health disorder during this time period a score of 0 was recorded. The same scoring method was applied for responses obtained from the father.

6. Parental alcohol or substance use

If a mother reported the presence of lifetime alcoholism or a drug addiction at 12 weeks gestation, a score of 1 was recorded and for those who reported no lifetime alcoholism or drug addiction, a score of 0 was recorded. The same scoring method was applied for responses obtained from the father.

2.3.4 Intermediary outcome measures

Variables obtained from participants when they were 18 years of age

The Moods and Feelings Questionnaire

The Moods and Feelings Questionnaire (MFQ-short version) is a 13-item screening tool for depression (Angold, Costello, Messer, & Pickles, 1995; Messer, et al, 1995). This measure has been found to be a reliable and valid measure of assessing depression in children and young people (Thabrew, Stasiak, Bavin, Frampton, & Merry, 2018). The

MFQ includes questions around cognitive aspects of low mood (e.g. “I found it hard to think properly or concentrate”), physical symptoms of depression (e.g. “I felt so tired I just sat around and did nothing”) and about current affective state (e.g. “I felt miserable or unhappy”). Each item on the MFQ is scored as follows: Not true = 0, Sometimes = 1 and True = 2. Scores on the MFQ short version range from 0-26 and a score of 12 and above is thought to be indicative of depression (see Appendix IV for descriptive statistics).

For the current intended analyses, however, a derived variable was created to identify individuals who scored below and above the recommended threshold score of 12 on the measure. For all scores between 0-11 on the MFQ a score of 0 was recorded indicating the absence of depression. For all scores between 12-26 on the MFQ, a score of 1 was recorded indicating the likely presence of depression.

Substance use

Variables concerning substance use were obtained from ALSPAC questionnaire measures when participants were 18 years of age.

Information from the following questions were utilised to create a derived substance use score. *In your life, which of the following substances have you ever used: (1) Cocaine (Charlie, ‘C’, coke), Crack (rock, stone), (2) Amphetamine-type stimulants (speed, base, diet pills, ecstasy, MDMA GHB, 2CB, 2CI, Mcat, Mephedrone), (3) Nitrous oxide (laughing gas), (4) Other inhalants (glue, petrol, paint thinner), (5) Hallucinogens (LSD, acid, mushrooms, PCP, ketamine, Special-K, N-Bomb), (6) Opioids (heroin, morphine, methadone, codeine) or (7) have you used any other drugs? An additional question on cannabis was also included: Have you ever tried cannabis (also called Marijuana, hash, dope, pot, blow, skunk, puff, grass, draw, ganja, joints, smoke or weed).*

For all of the above, a response of “Yes” was scored as 1 and a response of “No” was scored as 0. Following this, a derived variable of no substance use vs. any substance use was created. For this, if a respondent had confirmed that they had tried one or more of the substances listed by responding with a “Yes”, a score of 1 was recorded and if a respondent had responded with a “No” to all of the above questions, a score of 0 was recorded.

2.3.5 Primary outcome measures of self-injurious behaviours

Non-suicidal self-injury

One variable on non-suicidal self-injury was obtained from ALSPAC questionnaire measures on deliberate self-harm, which were completed by participants at the age of 20. Non-suicidal self-injury in this instance was defined as, ‘*hurting yourself on purpose in any way (e.g. cutting yourself)*’. If a respondent self-reported non-suicidal self-injury at the age 20, a score of 1 was recorded. However, if a respondent self-reported the absence of any such experiences at the age 20, a score of 0 was recorded.

Suicidal behaviours – a suicide attempt

One variable on suicide attempt/s was obtained from questionnaire measures on life events, which were completed by participants at the age of 23. If a respondent self-reported a suicide attempt between the ages of 22 and 23, a score of 1 was recorded and if they self-reported the absence of a suicide attempt between the ages of 22 and 23, a score of 0 was recorded.

2.4 Data analysis

2.4.1 Statistical analyses

All statistical analyses were conducted using SPSS statistical software, version 25.0 (IBM, 2017) or Mplus version 8.0 (Muthén, & Muthén, 1998-2017).

1. *Initial analyses were conducted to ascertain how the sub-sample compares to the full ALSPAC sample.*

For this, chi-square independence tests were used to ascertain how the current sub-sample compared to the full ALSPAC sample on the included demographic variables (gender, ethnicity and family social class). In addition to this, chi square independence tests were also utilised to identify whether participants in the sub-sample differed in terms of exposure to childhood emotional abuse and additional adversities in comparison to the full ALSPAC sample.

Further analyses were also conducted to ascertain how those with a history of emotional abuse in childhood differed from those without such a history within the current sub-sample. Specifically, chi-square independence tests were used to test if the included demographic covariates (gender, ethnicity and family social class) differed between those categorised as having experienced emotional abuse and those without such a history. Furthermore, chi square independence tests were used to test if those with a history of childhood emotional abuse are significantly more likely to have experienced higher levels of adversity in comparison to those without a history of childhood emotional abuse.

2. *Analyses were conducted to ascertain whether a history of childhood emotional abuse is associated with and predicts both the intermediary outcomes and primary outcomes in early adulthood.*

Initial chi-square independence tests were utilised to identify whether (1) those with a history of childhood emotional abuse are significantly more likely to meet criteria for depression at age 18, (2) are more likely to report any substance use at age 18, (3) self-report engaging in non-suicidal self-injurious behaviours at age 20 and self-report a suicide attempt between the age 22-23 years in comparison to those without a history of childhood emotional abuse. Following this, logistic regression analyses were conducted to ascertain the strength of these associations. Specifically, between: (1) experiencing childhood emotional abuse and depression at age 18, (2) experiencing childhood emotional abuse and reporting substance use at age 18 years, (3) experiencing childhood emotional abuse and self-reporting engaging in non-suicidal self-injurious behaviours at age 20 and self-reporting a suicide attempt between age 22-23.

3. Analyses were conducted to ascertain the specific nature of any identified relationships between childhood emotional abuse and the intermediary outcomes and subsequent self-injurious behaviours, in early adulthood.

For this, path analyses, which are a form of structural equation modelling, were then conducted in order to ascertain total indirect and direct effects that may exist between the following: (1) childhood emotional abuse, to depression at age 18 leading to non-suicidal self-injury at age 20, (2) childhood emotional abuse, to substance use at age 18 leading to non-suicidal self-injury at age 20, (3) childhood emotional abuse, to depression at age 18 leading to a suicide attempt between age 22-23 (4) childhood emotional abuse, to substance use at age 18 leading to a suicide attempt by age 23 and (5) childhood emotional abuse, to non-suicidal self-injury at age 20 leading to a suicide attempt between age 22-23.

4. *Finally, analyses were conducted to identify what factors predict non-suicidal self-injurious behaviours the most, when considered simultaneously. Similar analyses were also conducted to understand what factors, when considered concurrently, predict a suicide attempt between age 22-23.*

For this, logistic regressions were conducted to identify whether childhood emotional abuse, depression or substance use predict non-suicidal self-injury at age 20 when considered simultaneously. Similar analyses were also conducted to understand which factors (childhood emotional abuse, depression, substance use or non-suicidal self-injury) predict a suicide attempt between 22-23 years when considered concurrently.”

2.5 Power calculations

Non-suicidal self-injury

A post hoc power calculation based on general population estimates and estimates of suicide within those reporting emotional abuse was conducted using the software programme GPower. Extant research indicates that the population prevalence of non-suicidal self-injury is of 17.2%, and that the odds ratio of non-suicidal self-injury within those reporting a history of emotional abuse in childhood is 3.42 (Liu, Scopelliti, Pittman, & Zamora, 2018). Therefore, given a total of 298 individuals reporting non-suicidal self-injury across the current sample of 1405 and using an α value of 0.05, the current study has adequate power (100%) for the intended analyses on non-suicidal self-injury.

Suicide attempt

A post hoc power calculation based on general population estimates and estimates of suicide within those reporting emotional abuse was conducted using the software programme GPower. Existing literature indicates a population prevalence of 2.7% of suicide attempts and an odds ratio of 3.01 of suicide attempts within those reporting a

history of emotional abuse in childhood (Goldberge et al, 2019; Turecki, & Brent, 2016). Therefore, given a total of 23 individuals reporting suicide attempt across the current sample of 1405 and using an α value of 0.05, the current study has limited power (36.3%). Therefore, the current study is not adequately powered for the intended analyses on suicide attempts in early adulthood, so these analyses will be exploratory in nature.

Results

3.1 Outline of the results

Data for the absence or presence of childhood emotional abuse and depression, substance use, non-suicidal self-injury and a suicide attempt in early adulthood was available for a total of 1405 individuals. This is 9.4% of the total ALSPAC sample. Therefore, the first section will report on how this sub-sample compared to the full ALSPAC sample. This will be followed by report on how those who had experienced childhood emotional abuse, within the current sub-sample, compared to those who had not had such experiences.

The second section will report current findings that investigated whether a history of childhood emotional abuse is associated with and predicts the following intermediary outcomes in early adulthood: depression (age 18) and substance use (age 18). Similarly, this section will also report on findings from analyses that investigated whether a history of childhood emotional abuse is associated with and predicts self-injurious behaviours in early adulthood: non-suicidal self-injury (age 20) and a suicide attempt (between 22-23 years).

The third section will report on the findings of the pathway analyses that were conducted to ascertain the specific nature of any identified relationships between childhood emotional abuse and the intermediary outcomes of depression and substance use at age 18 and subsequent self-injurious behaviours (non-suicidal self-injury and a suicide attempt) in early adulthood.

The fourth and final section will report findings from analyses that were conducted in order to identify which factors (childhood emotional abuse, depression or substance use) predicted non-suicidal self-injury at age 20 when considered simultaneously. Similar this

section will also report on findings from analyses that were conducted to identify which factors (childhood emotional abuse, depression, substance use or non-suicidal self-injury) when considered concurrently predicted a suicide attempt between the age of 22-23 years.

3.2 Comparison of baseline characteristics between the sub-sample and full ALSPAC sample

Initial descriptive analyses were conducted to ascertain how the current sub-sample compared to the full ALSPAC sample (see Table 1A). Group comparisons revealed that the current sub-sample differed significantly from the full ALSPAC sample in terms of gender, ethnicity and social class. More specifically, participants within the current sub-sample were more likely to be female, more likely to self-identify as White and more likely to be from a higher social class in comparison to individuals from the full ALSPAC sample. Furthermore, participants within the current sub-sample were less likely to be exposed to additional risk factors in childhood when compared to the full ALSPAC sample (see Table 1A).

Table 1A: Baseline characteristics: sub-sample in comparison with the full ALSPAC sample

Demographic variable	Full ALSPAC N (%) / M (SD)	Sub-sample N (%) / M (SD)	Statistic
Gender	N = 13476	N = 1405	$\chi^2 (1) = 202.37, p = .001^*$
Female	6339 (47.0)	941 (67.0)	
Male	7137 (53.0%)	464 (33.0)	
Ethnicity	N = 10671	N = 1405	$\chi^2 (1) = 13.05, p = .001^*$
White	10105 (94.7)	1362 (96.9)	
Non-White	566 (5.3)	43 (3.1)	
Family social class	N = 9680	N = 1405	$t = 12.49, p = .001^*$
	3.55 (1.16)	3.14 (1.08)	
Risk factors associated with childhood maltreatment	N = 12282	N = 1405	$t = 11.07, p = .001^*$
	1.25 (1.0)	0.95 (0.95)	

Therefore, the current sub-sample significantly differed from the full ALSPAC sample. Owing to this, all subsequent analyses conducted within the sub-sample included the following confounders: gender, ethnicity social class and the risk score to mitigate bias. Furthermore, for all regression analyses, bootstrapped 95% bias corrected and accelerated confidence intervals are provided.

3.2.1 Comparison of the presence of childhood emotional abuse between the current sub-sample and the full ALSPAC sample

Within the full ALSPAC sample, a total of 10123 (87.6%) individuals were identified as not having experienced childhood emotional abuse and the remaining 1436 (12.4%) individuals were identified as having experienced childhood emotional abuse at some point from birth up to the age of 12.5 years. However, within the current sub-sample, a total of 1198 (85.3%) individuals were identified as not having experienced childhood emotional abuse and the remaining 207 (14.7%) individuals were identified as having experienced childhood emotional abuse from birth up to the age of 12.5 years. Therefore, there was a higher proportion of individuals who experienced childhood emotional abuse within the current sub-sample in comparison to the full ALSPAC sample and this difference was found to be significant ($\chi^2 (1) = 6.04, p = .015$).

3.2.2 Baseline characteristics: those with childhood emotional abuse vs. those without within the sub-sample

Analyses were conducted to examine whether there were any differences between those with a history of emotional abuse and those without such a history within the current sub-sample (see Table 1B). Analyses revealed that there were no differences between the groups in terms of gender, ethnicity or social class. However, those with childhood

emotional abuse were found to have had experienced a greater mean number of adversities in childhood in comparison to those without such a history.

Table 1B: Baseline characteristics: those with childhood emotional abuse vs. those without within the sub-sample

Demographic variable	EA not reported N (%) / M (SD)	EA reported N (%) / M (SD)	Statistic
Gender	N = 1198	N = 207	$\chi^2 (1) = 0.55, p = .472$
Female	807 (67.4)	134 (64.7)	
Male	391 (32.6)	73 (35.3)	
Ethnicity	N = 1198	N = 207	$\chi^2 (1) = 0.53, p = .510$
White	1163 (97.1)	199 (96.1)	
Non-White	35 (2.9)	8 (3.9)	
Family social class	N = 1198	N = 207	$t = 0.80, p = .043$
Risk factors associated with childhood maltreatment	N = 1198	N = 207	$t = 2.37, p = .019^*$
	0.92 (0.92)	1.11 (1.07)	

EA – Emotional Abuse.

3.2.3 Summary of findings

Overall, the sub-sample includes participants who appear to be of a higher social class, more likely to self-identify as White and be female when compared to the full ALSPAC sample. Furthermore, those in the sub-sample were also less likely to have been exposed to a range of adversities commonly associated with childhood maltreatment. Interestingly though, the sub-sample included a slightly higher proportion of individuals who were identified as having experienced childhood emotional abuse in comparison to the full ALSPAC sample.

Within the sub-sample those with a history of childhood emotional abuse did not differ from those without such a history in relation to gender, ethnicity or social class. However, those who had experienced childhood emotional abuse were significantly more likely to have also experienced a higher number of risk factors when compared to those who did not experience childhood emotional abuse.

3.3 Outcome variables: those with emotional abuse in comparison to those without

Descriptive analyses indicated that within the current sub-sample, a history of childhood emotional abuse was significantly associated with the intermediate outcomes of depression at age 18 and substance use at age 18. Furthermore, childhood emotional abuse was also significantly associated with non-suicidal self-injury at age 20 and a suicide attempt between the age of 22-23 years (see Table 2). Collectively, these findings indicate that emotional abuse is associated with a significantly increased risk of psychopathology in early adulthood. Of note, the number of individuals reporting a suicide attempt between the age of 22-23 years was extremely limited, so these findings should be interpreted with caution.

Table 2: Comparison of the presence of Depression, substance use and suicidal behaviours between those with and without a history of emotional abuse within the current sub-sample

Outcome variable	Total sub-sample	Emotional abuse not reported	Emotional abuse reported	Statistic
	N = 1405 N (%)	N = 1198 N (%)	N = 207 N (%)	
Depression (Age 18)				
No depression	1167 (83.1)	1017 (84.9)	150 (72.5)	$\chi^2 (1) = 19.38,$ $p = .001^*$
Depression reported	238 (16.9)	181 (15.1)	57 (27.5)	
Substance use (Age 18)				
No substance use	891 (63.4)	777 (64.9)	113 (54.6)	$\chi^2 (1) = 8.02,$ $p = .005^*$
Any substance use	514 (36.6)	421 (35.1)	94 (45.5)	
Non-Suicidal Self Injury (Age 20)				
No NSSI	1107 (78.8)	958 (80.0)	149 (72.0)	$\chi^2 (1) = 6.74,$ $p = 0.01$
NSSI present	298 (21.2)	240 (20.0)	58 (28.0)	
Suicide attempt (Age 22-23)				
No suicide attempt	1382 (98.4)	1185 (98.9)	197 (95.2)	<i>Fisher's Exact Test</i> $P = .001^*$
Suicide attempt reported	23 (1.6)	13 (1.1)	10 (4.8)	

3.3.1 Does childhood emotional abuse predict depression and/or substance use at age 18?

Analyses revealed that the presence of childhood emotional abuse doubled the risk of depression at age 18 and this finding remained once adjusted for confounders (Adj. OR = 2.10, 95% BCa CI 0.39– 1.07, $p = .001$). In addition to this, results also revealed that those with a history of childhood emotional abuse were 1.5 times more likely to self-report substance use at age 18 (see Table 3). This association also held once adjusted for all confounders (Adj. OR = 1.56, 95% BCa CI 0.15 – 0.77, $p = .005$).

3.3.2 Does childhood emotional abuse predict non-suicidal self-injury at age 20 and a suicide attempt between the age of 22- 23 years?

Analyses revealed that those who had experienced emotional abuse were 1.5 times more likely to self-report non-suicidal self-injurious behaviours at age 20 when compared to those without a history of emotional abuse. (see Table 3). This finding held once adjusted (Adj. OR = 1.55, 95% BCa CI 0.04 – 0.79, $p = .016$). Finally, results indicated that those with childhood emotional abuse were four times more likely to self-report a suicide attempt between the age of 22-23 years and this finding also held once adjusted for confounders (Adj. OR = 4.09, 95% BCa CI 0.56 – 2.19, $p = .002$).

Table 3: Logistic regression analyses within the sub-sample by childhood emotional abuse

Impact of emotional abuse in adulthood	Emotional abuse not reported N (%)	Emotional abuse reported N (%)	Unadjusted Odds ratio (95% CI)	P Value	Adjusted Odds ratio (95% BCa bootstrap Confidence Intervals based on 1000 samples)	P Value
Intermediary outcome variables						
Depression (Age 18)						
No depression	1017 (84.9)	150 (72.5)	2.14 (1.51 – 3.01)	.001*	2.10 (0.39 – 1.07)	.001*
Depression reported	181 (15.1)	57 (27.5)				
Any substance use (Age 18)						
No reported	777 (64.9)	113 (54.6)	1.54 (1.14 – 2.07)	.005*	1.56 (0.15 – 0.77)	.005*
Substance use reported	421 (35.1)	94 (45.5)				
Primary outcome variables						
Non-suicidal self-injury (Age 20)						
Not reported	958 (80.0)	149 (72.0)	1.55 (1.11 – 2.17)	.010*	1.55 (0.04 – 0.79)	.016*
Reported	240 (20.0)	58 (28.0)				
Self-reported suicide attempt (Age 23)						
No reported	1185 (98.9)	197 (95.2)	4.63 (2.00 – 10.70)	.001*	4.09 (0.56 – 2.19)	.002*
Reported	13 (1.1)	10 (4.8)				

Covariates included in the adjusted model were: Gender, Ethnicity, Family social class and the Risk score

3.3.3 Contingency analyses

Owing to the relatively limited number of participants within the current sample, additional analyses were conducted to identify the proportion individuals within each primary outcome category. Results indicated that of the 298 individuals who reported non-suicidal self-injury, 19.5% were identified as having experienced childhood emotional abuse, just over a third self-reported depression at age 18 and just over 50% self-reported substance use at age 18. (see Table 4).

In terms of the 23 individuals who self-reported a suicide attempt between the age of 22-23 years, 43.4% were identified as having a history of emotional abuse in childhood, just under 50% self-reported depression at age and just over 50% self-reported substance use at age 18. Of importance, just under 80% of those who had self-reported a suicide attempt between 22 and 23 years had previously reported engaging in non-suicidal self-injurious behaviours at age 20 (see Table 4), adding credence to the validity of the current findings.

Table 4: Contingency table

	Emotionally Abused N (%)	Depression at 18 N (%)	Drugs at 18 N (%)	NSSI at 20 N (%)	Suicide Attempt 22-23 N (%)
NSSI	58 (19.4)	102 (34.2)	156 (52.3)	298 (100)	18 (6.04)
Suicide Attempt	10 (43.4)	11 (47.8)	12 (52.1)	18 (78.2)	23 (100)

NSSI: Non-Suicidal Self-Injury

3.3.4 Summary of findings

Childhood emotional abuse was found to be significantly associated with and predict depressive symptoms, use of an illicit substance, non-suicidal self-injury and a suicide attempt in early adulthood. More specifically, childhood emotional abuse was found to double the odds of an individual developing depression at age 18. It was also found to increase the odds of substance use and non-suicidal self-injury by 1.56 and 1.55

respectively. Most concerningly, however, childhood emotional abuse was found to result in a fourfold increase in the odds of a suicide attempt between the age of 22-23 years. The current findings, particularly those investigating the association between childhood emotional abuse and a suicide attempt are limited by a small sample size and are therefore exploratory in nature. However, contingency analyses do add credence to the validity of the current findings. In sum, within the current sub-sample, a history of childhood emotional abuse was associated with significant psychopathology and a significantly increased risk of self-injurious behaviours in early adulthood.

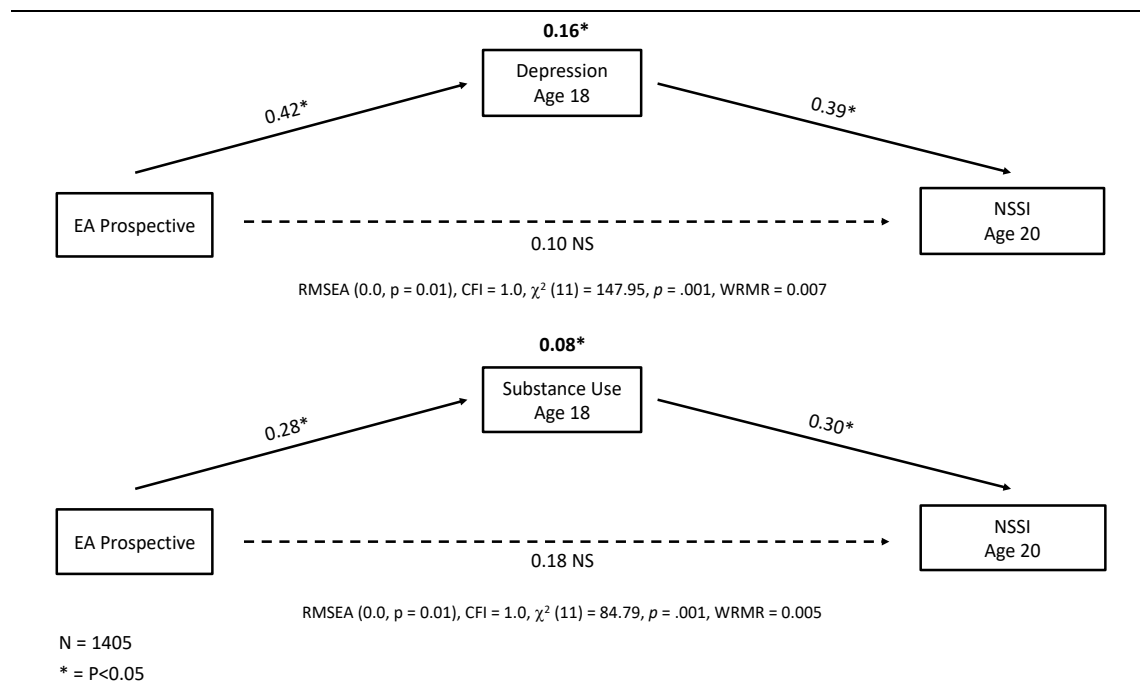
3.4 Pathways to suicidal behaviours

Path analysis, which is a type of structural equation modelling was used to identify any direct and/or indirect (e.g. via depression or substance use) pathways from childhood emotional abuse to self-injurious behaviours that may exist. Goodness of fit was assessed using four indices; root mean square error of approximation, the comparative fit index, chi square test of model fit for the baseline model and the weighted root mean square residual. A satisfactory model fit was indicated across these indices for each of the five models presented below.

For non-suicidal self-injury, analyses indicated that emotional abuse acts indirectly through depression at age 18 leading to a significant increase in non-suicidal self-injurious behaviours at age 20 (bootstrapped standardised estimate 0.16, $p = 0.001$; see Figure 1). Similarly, emotional abuse was found to act indirectly through substance use at age 18 leading to a significant increase in non-suicidal self-injury at age 20 (bootstrapped standardised estimate 0.08, $p = 0.009$; see Figure 1). However, the direct pathway from emotional abuse to non-suicidal self-injury was not found to be significant in either case (bootstrapped standardised estimate 0.10, $p = 0.36$; 0.18, $p = 0.08$; see

Figure 1). Therefore, these findings suggest that emotional abuse appears to only act indirectly via depression and substance use at age 18 to increase the risk of an individual engaging in non-suicidal self-injurious behaviours at age 20.

Figure 1 – Pathways from childhood emotional abuse to non-suicidal self-injury at age 20



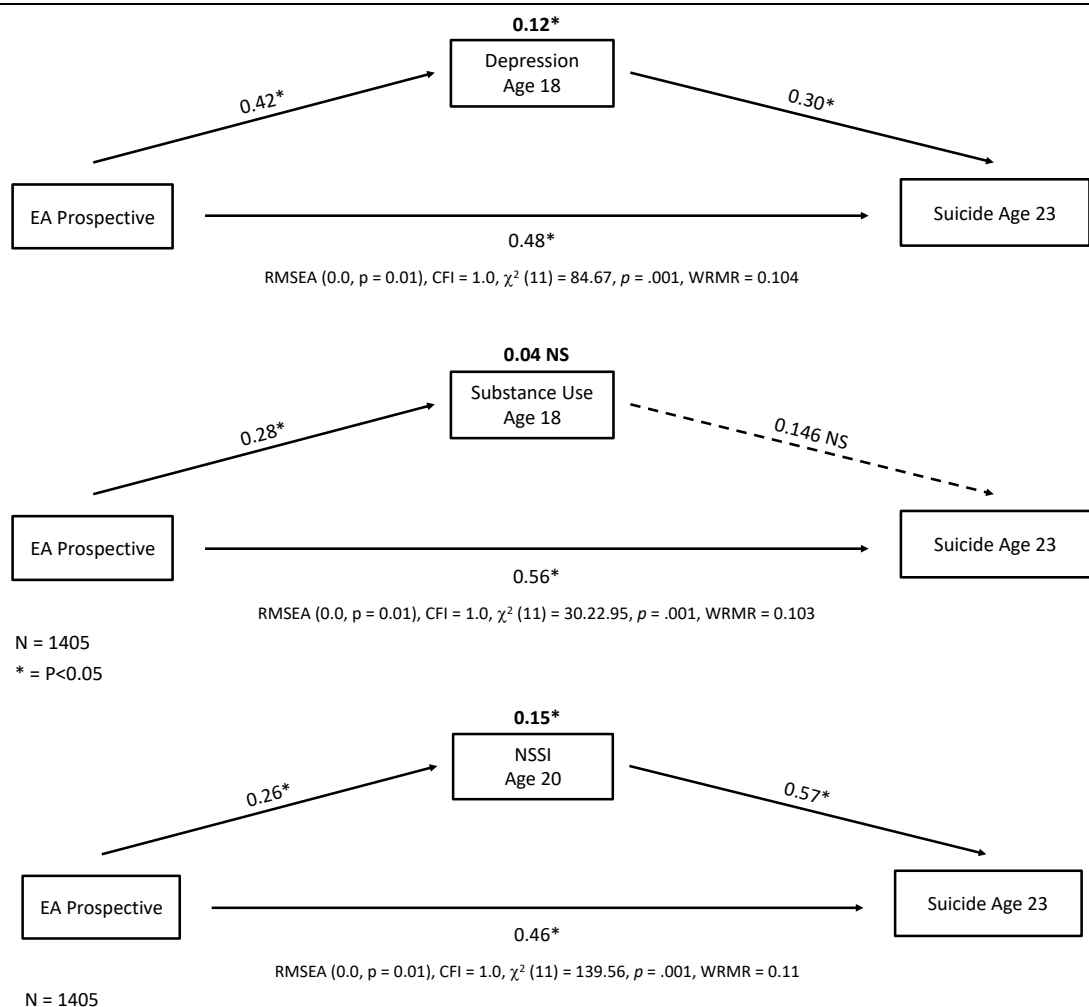
Further exploratory analyses were conducted to identify any pathways, direct and indirect, from childhood emotional abuse to a subsequent suicide attempt between the age of 22-23 years that may exist. Findings indicated the presence of both a direct pathway and an indirect pathway, via depression and non-suicidal self-injury, from childhood emotional abuse to a suicide attempt. However, findings demonstrated that childhood emotional abuse did not indirectly increase the likelihood of a suicide attempt via substance use (see Figure 2). Specific findings are reported below.

Emotional abuse was observed to act directly (bootstrapped standardised estimate 0.48, p = 0.016), and indirectly via depression at age 18 to significantly increase the risk of a suicide attempt between the age of 22-23 years (bootstrapped standardised estimate 0.12, p = 0.034).

Nevertheless, analyses demonstrated that emotional abuse does not appear to act indirectly via substance use at age 18 to increase the likelihood of a suicide attempt between the age of 22-23 years (bootstrapped standardised estimate 0.04, $p = 0.26$) but does so directly (bootstrapped standardised estimate 0.56, $p = 0.003$).

Finally, emotional abuse was observed to act directly (bootstrapped standardised estimate 0.46, $p = 0.011$), and indirectly via non-suicidal self-injury at age 20 to significantly increase the risk of a suicide attempt between the age of 22-23 years (bootstrapped standardised estimate 0.15, $p = 0.016$).

Figure 2 – Pathways from childhood emotional abuse to a suicide attempt between 22-23 years



3.4.1 Summary of findings

Current analyses demonstrated the absence of a direct pathway from emotional abuse to subsequent non-suicidal self-injurious behaviours at age 20. However, findings did demonstrate that childhood emotional abuse appears to act indirectly via both depression and substance use, at age 18, to significantly increase the risk of an individual engaging in non-suicidal self-injurious behaviours at age 20.

In the case of more lethal self-injurious behaviours, however, childhood emotional abuse was found to directly increase the risk of a subsequent suicide attempt between the age of 22-23 years. Furthermore, emotional abuse in childhood was also found to indirectly, via both depression and non-suicidal self-injury, increase an individual's risk of a suicide attempt between the age of 22-23 years. These findings were based on a limited sample, however and so are exploratory in nature.

3.5 Predictors of non-suicidal self-injury or a suicide attempt in early adulthood

3.5.1 Predictors of non-suicidal self-injury in early adulthood

Further analyses were then conducted in order to identify which factors (childhood emotional abuse, depression at age 18 and substance use at age 18) predicted non-suicidal self-harm at age 20 when considered simultaneously (see Table 5A). Initial analyses identified that emotional abuse predicted non-suicidal self-injury. Therefore, after emotional abuse was added to the model, depression at age 18 and then substance use at age 18 were added in a stepwise manner. The addition of both of these variables improved the fit of the model and so were retained. A further two steps were then undertaken. The first was to build the adjusted model by including the following covariates: gender, ethnicity, family social class and the risk score. The second and final step was to re-run

the analysis to obtain bootstrapped 95% bias corrected and accelerated confidence intervals (see Appendix V for the results).

Results revealed that of all of the included predictors, depression increased the odds of non-suicidal self-injury the most, and this finding remained when adjusted (Adj. OR = 3.27, 95% BCa CI 0.85 – 1.50, $p = .001$). Similarly, substance use also significantly increased the odds of non-suicidal self-injury and this finding held once adjusted (Adj. OR = 2.31, 95% BCa CI 0.55 – 1.14, $p = .001$). A small but significant effect of gender was also observed, such that males were less likely to self-report non-suicidal self-injury (Adj. OR = 0.55, 95% BCa CI (-0.93 – -0.32), $p = .001$). Interestingly, when considered simultaneously, with depression and substance use at age 18, childhood emotional abuse did not significantly increase the risk of subsequent non-suicidal self-injury. This suggests that those who have experienced childhood emotional abuse and report depression or substance use at age 18 are most at risk of engaging in non-suicidal self-injurious behaviours.

Table 5A: Predictors of non-suicidal self-injury at age 20

Non-suicidal self-injury (Age 20)	Unadjusted odds ratio	P Value	Adjusted odds ratio (95% BCa bootstrap confidence intervals based on 1000 samples)	P Value
Emotional abuse	1.22 (0.86 – 1.75)	0.27	1.233 (-0.20 – 0.57)	0.29
Depression (Age 18)	3.61 (2.66 -4.91)	.001*	3.27 (0.85 – 1.50)	.001*
Substance use (Age 18)	2.25 (1.72 – 2.94)	.001*	2.31 (0.55 – 1.14)	.001*

Covariates included in the adjusted model were: Gender, Ethnicity, Family social class and the Risk score

3.5.2 Predictors of a suicide attempt in early adulthood

Sample numbers for the analyses on suicide attempt between the age of 22-23 years were limited ($n = 23$). Therefore, exploratory analyses were conducted to identify which factors (childhood emotional abuse, depression at age 18, substance use at age 18 or non-suicidal

self-injury at age 20) when considered simultaneously were predictive of a suicide attempt between the age of 22-23 (see Table 5B).

Initial analyses identified that emotional abuse predicted a suicide attempt in early adulthood. Therefore, after emotional abuse was added to the model, depression at age 18 substance use at age 18 and non-suicidal self-injury at age 20 were added in a stepwise manner. The addition of both depression at age 18 and non-suicidal self-injury at age 20 improved the fit of the model and so were retained. The addition of substance use at age 18 did not, however, improve the fit of the model, so was excluded from the final model. A further two steps were then undertaken. The first was to build the adjusted model by including the following covariates: gender, ethnicity, family social class and the risk score. The second and final step was to re-run the analysis to obtain bootstrapped 95% bias corrected and accelerated confidence intervals (see Appendix V).

Results revealed that emotional abuse directly increased the risk of a suicide attempt between the age of 22-23 years and this finding held when adjusted (Adj. OR = 3.17, 95% BCa CI (0.16 – 2.14), $p = .010$). Of all the included predictors, non-suicidal self-injury was found to predict a subsequent suicide attempt the most and this finding held once adjusted (Adj. OR = 11.07, 95% BCa CI (1.14 -9.95), $p = .001$). Interestingly, depression significantly predicted an increased likelihood of a future suicide attempt when considered in conjunction with childhood emotional abuse (Adj. OR = 3.42, 95% BCa CI (-0.29 – 2.19), $p = .002$). However, when considered simultaneously with emotional abuse and non-suicidal self-injury, depression ceased to predict an increased risk of a subsequent suicide attempt (Adj. OR = 1.84, 95% BCa CI (-0.45 – 1.60), $p = 0.22$).

Table 5B: Predictors of a suicide attempt between 22-23 years

Suicide attempt (Age 22-23)	Unadjusted odds ratio	P Value	Adjusted odds ratio (95% BCa bootstrap confidence intervals based on 1000 samples)	P Value
Emotional abuse	3.46 (1.45 – 8.29)	.005*	3.17 (0.16 – 2.14)	0.01*
Depression (Age 18)	2.06 (0.85 – 4.99)	0.11	1.84 (-0.45 – 1.60)	0.22
Non-suicidal self-injury (Age 20)	10.86 (3.87 – 30.51)	.001*	11.07 (1.14 – 9.95)	.001*

Covariates included in the adjusted model were: Gender, Ethnicity, Family social class and the Risk score

3.5.3 Summary of findings

The above analyses indicate that when childhood emotional abuse is considered simultaneously with depression and substance use at age 18, it ceases to directly predict subsequent non-suicidal self-injurious behaviours in early adulthood. However, both depression and substance abuse at age 18, in the context of childhood emotional abuse, did predict subsequent non-suicidal self-injurious behaviours. Furthermore, depression at age 18, in the context of childhood emotional abuse, appeared to be the strongest predictor of future non-suicidal self-injurious behaviours.

However, when considered concurrently, childhood emotional abuse and non-suicidal self-injurious behaviours at age 20 were the only two factors that predicted a subsequent suicide attempt between the age of 22-23 years. Of these, non-suicidal self-injurious behaviours were found to be the strongest predictor of a subsequent suicide attempt.

Discussion

4.1 Aims

The main findings will be presented in relation to the primary hypotheses of the current study. This will be followed by a discussion of the current findings and the key implications of these findings. The penultimate section will consider the limitations of the current study and provide recommendations for possible future work. The final section will comprise of key concluding remarks.

4.2 Summary of main findings

4.2.1 Hypothesis one

Individuals who have experienced emotional abuse in childhood will be more likely to engage in self-injurious behaviours in early adulthood

Initial regression analyses revealed a weak association between childhood emotional abuse and non-suicidal self-injury but a strong association between childhood emotional abuse and the risk of a suicide attempt in early adulthood.

Further path analyses revealed that those who had experienced childhood emotional abuse were not significantly more likely to report non-suicidal self-injury at age 20. However, analyses did reveal that those with a history of childhood emotional abuse were significantly more likely to report a suicide attempt between the age of 22-23 years.

Further regression analyses supported these findings, as when childhood emotional abuse was considered concurrently with depression and substance use, it did not predict non-suicidal self-injury. However, when considered in combination with depression and non-suicidal self-injury, childhood emotional abuse significantly increased the odds of a suicide attempt between the age of 22-23 years.

Therefore, the findings suggest that those who have experienced emotional abuse are at a higher risk of engaging in self-injurious behaviours in early adulthood where the intent is to terminate consciousness rather than to temporarily modify it.

4.2.2 Hypothesis two

The presence of depression at age 18, in the context of childhood emotional abuse, will increase the risk of an individual subsequently engaging in self-injurious behaviours in early adulthood

Preliminary regression analyses indicated that individuals who have experienced childhood emotional abuse were significantly more likely to report depression at age 18. Furthermore, these individuals were also significantly more likely to report engaging in non-suicidal self-injurious behaviours at age 20 and to report a suicide attempt between the age of 22-23 years. Path analyses revealed that individuals who had experienced childhood emotional abuse were significantly more likely to report depression at age 18 and later report both non-suicidal self-injury at age 20 and a subsequent suicide attempt between the age of 22-23 years. Further analyses indicated that when depression was considered concurrently with emotional abuse and non-suicidal self-injury, however, it ceased to significantly predict a future suicide attempt.

Collectively, these findings indicate that depression at age 18 may in some instances serve to directly increase the risk of a later suicide attempt in early adulthood. However, the findings suggest that depression at the age of 18 is more likely to indirectly increase the risk of a suicide attempt by increasing the risk of an individual engaging in non-suicidal self-injurious behaviours. The current findings therefore indicate that individuals who have experienced emotional abuse in childhood and later develop depression in adulthood are at an elevated risk of engaging in both non-lethal and lethal self-injurious behaviours.

4.2.3 Hypothesis three

The presence of substance use at age 18, in the context of childhood emotional abuse, will increase the risk of an individual subsequently engaging in self-injurious behaviours in early adulthood

Initial regression analyses revealed that individuals who had experienced childhood emotional abuse were significantly more likely to report using an illicit substance at age 18 and subsequently report non-suicidal self-injurious behaviours at age 20. However, these individuals were not significantly more likely to report a suicide attempt between the age of 22-23 years. Further path analyses confirmed these findings.

Therefore, the current findings indicate that those who have experienced childhood emotional abuse and report substance use at age 18 are at an increased risk of engaging in non-suicidal self-injurious behaviours in early adulthood.

4.2.4 Hypothesis four

The presence of non-suicidal self-injury at age 20, in the context of childhood emotional abuse, will increase the risk of an individual reporting a suicide attempt between the age of 22 and 23 years

Findings from path analyses revealed that those who have experienced emotional abuse are significantly more likely to report non-suicidal self-injury at age 20 and then subsequently report a suicide attempt between the age of 22 and 23 years. Further regression analyses also confirmed that non-suicidal self-injury, when considered simultaneously with childhood emotional abuse and depression, was the strongest predictor of a future suicide attempt. These analyses were, however, exploratory in nature due to limited data and so further work is required to corroborate these findings.

4.2.5 Summary

The current findings have identified that childhood emotional abuse independently increases the risk of self-injurious behaviours in adulthood. Furthermore, when it is combined with depression or substance use, which are known to independently increase the risk of self-injurious behaviours, the risk is further elevated. Those with a history of emotional abuse who reported non-suicidal self-injury were also more likely to transition to suicidal behaviours between the age of 22-23 years. Importantly, the risk of engaging in suicidal behaviours in early adulthood appear to be the most elevated for those who have experienced childhood emotional abuse, reported depression at age 18 and subsequently reported non-suicidal self-injurious behaviours at age 20.

4.3 Discussion of key findings

Findings from the current study add to the growing body of research that have found childhood emotional abuse to significantly increase the likelihood of deleterious outcomes both in the short and long-term. Specifically, the current findings demonstrate that childhood emotional abuse is associated with a number of factors that progressively increase an individual's risk of engaging in self-injurious behaviours in early adulthood.

The presence of substance use at age 18, in the context of childhood emotional abuse, was found to be associated with an increased risk of non-suicidal self-injury. This is consistent with existing research (Taillieu, Brownridge, Sareen, & Afifi, 2016; Mandavia, Robinson, Bradley, Ressler, & Powers, 2016; Norman Byambaa, De, Butchart, Scott, & Vos, 2012; Khoury, Tang, Bradley, Cubells, & Ressler, 2010; Scheidell et al, 2018). It has been proposed that this may be due to such individuals experiencing higher levels of emotional distress. This is consistent with the self-medication hypothesis, which posits that substances may be used as a strategy to cope with or gain relief from painful

emotions, to experience emotions that may be absent or to control distressing or confusing emotions (Khantzian, 1985; 1997). Similarly, the most common reason provided for engaging in non-suicidal self-injury is that it is a means to regulate emotions and unpleasant cognitive states (Bentley, Nock, & Barlow, 2014; Taylor, Jomar, Dhingra, Forrester, Shahmalak, Dickson, 2017). Therefore, it is a maladaptive coping strategy that, at least initially, appears to serve similar function to substance use. Given this, it is possible that individuals with a history of childhood emotional abuse may, over time, require additional strategies such as non-suicidal self-injurious behaviours in order to regulate distressing emotive states.

The current study also identified that individuals most at risk of engaging in more lethal self-injurious behaviours were those who had experienced childhood emotional abuse, reported depression at age 18 and subsequently reported non-suicidal self-injurious behaviours at age 20. The finding that childhood emotional abuse significantly increases the risk of depression in adulthood is well established (Taillieu, Brownridge, Sareen, & Afifi, 2016; Christ et al, 2019; Gerke, et al, 2018; Gibbs, Chelminski, & Zimmerman, 2007; Mandelli, Petrelli, & Serretti, 2015; Norman Byambaa, De, Butchart, Scott, & Vos, 2012). Moreover, research findings also demonstrate that depression commonly co-occurs with non-suicidal self-injury (Bentley, Cassiello-Robbins, Vittorio, Sauer-Zavala, & Barlow, 2015; Kiekens, et al, 2018; Taliaferro, & Muehlenkamp, 2015). A key characteristic of depression is the presence of maladaptive cognitive strategies such as rumination and the suppression of negative thoughts and feelings. However, the presence of non-suicidal self-injury is also thought to independently increase the risk of suicidal ideation (Van Orden, Witte, Cukrowicz, Braithwaite, Selby, & Joiner, 2010). Therefore, the combination of depression and non-suicidal self-injury is likely to result in higher levels of distress and suicidal ideation, increasing the risk of an individual engaging in

more lethal self-injurious behaviours (Cha, Franz, Guzman, Glenn, Kleiman, & Nock, 2018).

The current finding that non-suicidal self-injury was the strongest predictor of a subsequent suicide attempt is also consistent with existing research (Hamza, & Willoughby, 2016; Whitlock, et al, 2013; Kiekens et al, 2018; Franklin et al, 2017; Klonsky, May & Glenn, 2013; Ribeiro, Franklin, Fox, Bentley, Kleiman, Chang, & Nock, 2016; Wilkinson, Kelvin, Roberts, Dubicka, & Goodyer, 2011; Guan, Fox & Prinstein, 2012). The interpersonal theory of suicide, posits that this may be due to non-suicidal self-injury increasing the risk of suicidal behaviours by increasing the likelihood of suicidal ideation and significantly, the capability to act on such thoughts over time (Joiner, 2005; Van Orden, Witte, Cukrowicz, Braithwaite, Selby, & Joiner, 2010). In instances where this is coupled with depression, the risk of suicidal behaviours, such as a suicide attempt, is likely to escalate even further, which could account for the current findings.

The current finding that childhood emotional abuse directly increases the risk of a suicide attempt in early adulthood is a finding that has been observed previously (Salokangas, Luutonen, Heinimaa, & Hietala, 2019). This could perhaps suggest that those with a history of childhood emotional abuse are more susceptible to engaging in lethal self-injurious behaviours in early adulthood. This finding supports a hypothesis, which states that early-onset suicidal behaviours may be mediated through the familial transmission of impulsive aggression in the context of abuse (McGirr, Alda, Seguin, Cabot, Lesage, 2009; Brent, Bridge, 2010).

Transitioning from childhood to adulthood may also increase an individual's vulnerability. For example, moving out of the family home, could result in a loss of

existing social networks leading to a decrease in levels of social connectedness and an increased sense of loneliness or isolation. Furthermore, in the presence of difficulties forming and establishing new relationships, commonly associated with the presence of emotional abuse, such difficulties are likely to be exacerbated. Over time, this could lead to an increase in levels of hopelessness, which in turn could increase an individual's propensity to engage in suicidal behaviours (Van Orden, Witte, Cukrowicz, Braithwaite, Selby, & Joiner, 2010).

It is also possible that engaging in suicidal behaviours at an earlier age is associated with one or more factors that were not measured in the current study. These factors could include a genetic predisposition, experiencing more severe forms of abuse, poly-victimisation, experiencing the abuse during a developmentally sensitive period, experiencing additional trauma, the presence of additional comorbidities including personality disorders, poor physical health or low levels of social support. Therefore, further work is required to establish this.

4.4 Possible mechanisms

The pathways from childhood emotional abuse to self-injurious behaviours are likely to be complex and involve a number of underlying mechanisms. The following section will, however, aim to highlight two possible interrelated mechanisms that may, in part, explain how childhood emotional abuse serves to increase the risk of self-injurious behaviours in early adulthood.

4.4.1 Insecure attachment

Attachment theory proposes that early experiences with primary caregivers form the basis of how the infant and subsequent child form mental templates or representations of their value and expectations of how relationships function (Bowlby, 1969; 1973). The theory

also posits that if a caregiver frequently either does not attend to a child or demonstrates rejecting or terrorising behaviours, the child is significantly more likely to develop an insecure attachment style. Indeed, existing research supports this position as emotional abuse has been found to increase the likelihood of a child developing an insecure, and in more severe cases, disorganised attachment styles (Steele, van der Hart, & Nijenhuis, 2013; Main & Hesse, 1990).

Insecure attachment styles, in adolescence and adulthood, are characterised by low levels of attachment security coupled with lower levels of self-esteem, difficulties with trust and interpersonal difficulties. Moreover, insecure attachment styles have also been found to be a significant risk factor for interpersonal conflict and poorer levels of, actual or perceived, social support (Muller, Gragtmans, & Baker, 2008; Ognibene, & Collins, 1998; Asendorpf, & Wilpers, 1998; Florian, Mikulincer, & Bucholtz, 1995). Low levels of social support coupled with interpersonal difficulties may also increase the risk of loneliness. Furthermore, the presence of an insecure attachment has been found to be associated with psychopathology, including depression and dysfunctional personality traits or personality disorders (Levy, Meehan & Temes, 2013; Doron, Moulding, Kyrios, Nedeljkovic, & Mikulincer, 2009; Morley, & Moran, 2011; Mickelson, Kessler, & Shaver, 1997). Notably, all of these factors have been found to be associated with an increased risk of self-injurious behaviours, either directly or indirectly.

4.4.2 Emotion dysregulation

In parallel, the ability to regulate emotions also begins to develop in early childhood. It is thought that a responsive and caring familial context along with early peer socialisation, which foster the development of a secure attachment, are important for the development of adaptive emotion regulation skills (Dvir, Ford, Hill, Frazier, 2014; Eisenberg, Spinrad,

& Eggum, 2010; Ford, 2005). Emotional abuse not only disrupts this process, but also increases the likelihood of emotional dysregulation, more so than any other form of abuse (Schulz et al, 2017; Crow, Cross, Powers & Bradley, 2014; Christ et al, 2019; Briere, & Rickards, 2007). Briefly, emotional dysregulation is characterised by a limited awareness, understanding and acceptance of emotions, difficulties with modulating emotional responses and difficulties engaging in goal directed behaviours, particularly when distressed (Gratz & Roemer, 2004). It is also associated with affective negativity, irritability, impulsivity, self-injurious behaviours and increased conflict in interpersonal relationships (Rogosch, Cicchetti, 2005). Therefore, the presence of emotional dysregulation, in early adulthood, is likely to have a considerable negative impact both at an intrapersonal and interpersonal level.

Both an insecure attachment style and emotional dysregulation independently increase the risk of an individual developing psychopathology and in particular depression (Berking, & Wupperman, 2012; Joorman & Stanton, 2016; Lee & Hankin, 2009; Morley & Moran, 2011; Khan, Fraley, Young, & Hankin, 2019; Bifulco, Moran, & Ball, 2002; Bifulco, Moran, Ball, & Lillie 2002; Chapman, Whitfield, Felitti, Dube, Edwards, & Anda, 2004). Moreover, both an insecure attachment and emotional dysregulation also significantly increase the likelihood of an individual subsequently utilising maladaptive coping strategies to alleviate emotional distress (Turner, Mota, Bolton, & Sareen, 2018; Oshri, Sutton, Clay-Warner, & Miller, 2015; Riggs, 2010). Therefore, as proposed above, it is possible that such individuals may progress to using non-suicidal self-injurious behaviours, as a means to manage overwhelming negative emotions. This may also explain why those with a history of childhood emotional abuse seemingly continue to engage non-suicidal behaviours, which over time increases the risk of an individual transitioning to the use of more lethal forms of self-injurious behaviours.

In sum, it is possible that both insecure attachment and emotional dysregulation play a pivotal role in the association between childhood emotional abuse and self-injurious behaviours in early adulthood. Therefore, future research is required to either confirm or refute this hypothesis.

4.5 Implications of current findings

The current findings underscore the importance of assessing for the presence of childhood emotional abuse in young adults presenting with psychopathology, as these individuals are likely to be at an elevated risk of engaging in lethal self-injurious behaviours in the future. Furthermore, it would be beneficial for mental health services to strengthen the provision of care for adolescents and young adults presenting with symptoms of depression and/or reporting non-suicidal self-injury. However, given the prevalence of emotional abuse, wider public health prevention initiatives are likely to be the most effective approach. For example, initiatives focussed on improving awareness of emotional abuse and the potentially devastating consequences of such experiences is likely to have a greater impact than mental health services can ever aspire to. Furthermore, initiatives within the education system focussed on enhancing pupil mental wellbeing and the development of skills and strategies for emotional regulation and communication are also likely to have significant positive long-term benefits. Most importantly, such combined approaches are likely to be the most effective means of reducing, and hopefully preventing, the intergenerational transmission of arguably the most damaging form of childhood abuse.

4.6 Limitations of the current study

The current study has a number of strengths. Namely, the prospective longitudinal methodology helped obtain a clearer understanding of the relationship between childhood

emotional abuse and subsequent self-injurious behaviours in early adulthood. Furthermore, it is the first study to investigate pathways from childhood emotional abuse to self-injurious behaviours in early adulthood. Nevertheless, there were a number of significant limitations and, therefore, the current findings need to be interpreted within the context of the limitations outlined below.

4.6.1 Sample

One of the key limitations of this study was the extent of participant attrition within the ALSPAC cohort, which resulted in significant levels of missing data. Owing to this, the current study was not adequately powered for the intended analyses on a suicide attempt in early adulthood. Therefore, these analyses are exploratory in nature. Importantly, data imputation was not attempted, as it is based on the assumption that the missing data is missing at random, which is not testable (White, Royston, & Wood, 2011). However, a concerted effort was made to mitigate possible bias and limit the possibility of Type II errors through the use of recommended statistical techniques.

For the same reasons, it was also not possible to consider the impact of all types of childhood maltreatment to ascertain whether indeed emotional abuse, in particular, increases the risk of suicidal behaviours over and above the other types of maltreatment in early adulthood. Similarly, it was also not possible to conduct more nuanced analyses to identify whether those who experienced poly-victimisation were more likely to experience more severe outcomes in early adulthood. Finally, owing to the extent of attrition, it was not possible to validate parental reports of emotional abuse in childhood with retrospective reports of abuse up to the age of 18 from the study children themselves. Based on census data, the number of Black and Ethnic Minority participants within the full ALSPAC sample is lower than would be expected given the geographical locale of

the study. This is further exacerbated in the current sub-sample, as a significant proportion of those who self-identified as Non-White did not participate in the latter phases of the ALSPAC study. Additionally, participants within the current sub-sample were also significantly more likely to be female. In terms of wider contextual factors, those within the current sub-sample were significantly more likely to be more affluent and report experiencing fewer adversities when growing up in comparison to participants from the full ALSPAC sample. Therefore, findings from the current study may not fully generalise to the wider UK general population.

Interestingly, there was a significantly higher proportion of individuals who experienced childhood emotional abuse within the current sub-sample in comparison to the full ALSPAC sample. It is not clear why this may be so. One possible explanation for this could be that those who had experienced childhood emotional abuse were more motivated to continue participating in ALSPAC due to increased psychopathology or in a bid to better understand their personal experiences.

For the current analyses, all participants who reported using one or more type of substance were included. Therefore, this sample included any of the following: individuals who would meet criteria for substance dependence or abuse, those who regularly use substances, those who are frequent/infrequent polysubstance users and also those who have experimented with using one or more type of substance on only one occasion. Thus, it is possible that a substantial proportion of participants who endorsed substance use may have been those who experimentally used substances infrequently or on only one occasion, rather than those who were perhaps experiencing problematic substance use. This may, in part, account for the finding that substance use was the weakest predictor of subsequent self-injurious behaviours.

4.6.2 Design

The current study is also limited by the fact that experiences of emotional abuse were only measured up to the age of 12.5 years. Given this, there is a possibility that some of the individuals identified as not having experienced childhood emotional abuse may have in fact experienced emotional abuse after the age of 12.5 years. However, emotional abuse within the family of origin from early to middle childhood is believed to be most damaging and these experiences have been captured within the current study (Khan, Fraley, Young, & Hankin, 2019).

4.6.3 Instruments

Assessment of childhood emotional abuse

Within ALSPAC, primary maternal and paternal caregivers provided information regarding the presence or absence of childhood emotional abuse. Data was obtained from both maternal and paternal primary caregivers independently and so was substantiated. Furthermore, parental reports were found to be highly consistent. Nevertheless, a validated and/or objective measure to assess for the presence of childhood emotional abuse was not utilised. Rather, findings are reliant upon each respondent's personal understanding of what constitutes emotional abuse and the ability to identify and report on whether the study child had been exposed to such experiences. A key limitation of using parental reports in this manner is that the parent may be the perpetrator themselves or be linked to the perpetrator, which, at the very least, could result in the underreporting of abuse that the child may be exposed to (Tajima et al, 2004). Therefore, it is possible that the current study may not have captured a proportion of those who may have been exposed to emotional abuse in childhood.

Outcome measures for depression, substance use and suicidal behaviours in early adulthood

All study outcome measures in early adulthood were self-report measures. Therefore, the current findings should be interpreted within the context of this. The measure used to identify symptoms of depression at age 18, the Moods and Feelings Questionnaire, however, has been found to be a validated and reliable measure. Therefore, these findings are likely to be of sufficient reliability and validity.

The measurement of substance use and self-injurious behaviours, however, may have been more likely to be influenced by factors such as social desirability, shame and/or fear and a related reticence to report such feelings, thoughts and behaviours. To mitigate such concerns, at the point of completion, the ALSPAC team reported reassuring all participants that any information provided would remain confidential. Of note, there are as yet no objective measures that can be used to assess for the presence of such experiences. Therefore, such self-report measures remain the best method at present to obtain such information, particularly for large scale studies such as ALSPAC.

An additional limitation of the current study was that depression and substance use were measured at the same point. Therefore, it is not possible to determine whether the substance use was subsequent to symptoms of depression or whether the symptoms of depression were preponed by substance use.

Finally, the two primary outcome variables, which measured the presence of non-suicidal self-injury and a suicide attempt were based on a single report. Therefore, it is possible that a proportion of participants who may have engaged in self-injurious behaviours may have opted to not to divulge this information. Relatedly, information regarding the frequency, severity and chronicity of these behaviours was not obtained. Therefore, it is

not possible to determine whether childhood emotional abuse is associated with more frequent, chronic and/or risky forms of self-injurious behaviours.

4.6.4 Possible covariates

The current study adjusted for a number of confounders but there are a number of further factors that were not considered due to the limited scope of the current thesis. Such factors include for example, levels of social support, interpersonal difficulties, perceived burden, attachment styles, difficulties with emotional regulation, stressful life events, experiences of bullying, comorbid psychiatric disorders, personality disorders, course of depressive illness, treatment provision, physical health status and exposure to familial self-injurious and suicidal behaviours. The current study also focussed only on environmental factors, so possible biological influences on associations between childhood emotional abuse and depression, substance use and self-injurious behaviours in early adulthood were not explored in the current study. Finally, the current study did not include any measures of resilience, so it is not possible to comment on individuals who despite experiencing childhood emotional abuse may not have reported any self-injurious behaviours in early adulthood.

4.7 Recommendations for future research

It would be beneficial for future research to assess all types of maltreatment and bullying experiences up to the age of 18. This would enable more detailed analyses to identify the impact of abuse and neglect, independently and in combination, on subsequent self-injurious behaviours.

The use of validated and, where possible, objective measures to assess for the presence of maltreatment would substantially increase the validity of the findings. Furthermore, both prospective and retrospective measures are limited in some respects. Therefore,

future studies, which combine both retrospective and prospective assessments of maltreatment are likely to be the most informative and reliable.

If possible, capturing symptoms of depression throughout childhood would also be beneficial. Similarly, identifying the point of initiation of any substance use, the type/s of substances, including alcohol, and frequency of use would enable a clearer understanding of the temporal precedence between depression and substance use. This would also help to improve our understanding of a complex relationship that is not currently well understood.

In terms of measuring self-injurious behaviours, it would be beneficial for future work to consider obtaining information on familial self-injurious behaviours, when the individual, began to engage in self-injurious behaviours, the reasons for this, the type of methods used, frequency and the progression from milder methods to more risky/lethal methods. This is important as an earlier onset of non-suicidal self-injury, repetitive self-injurious behaviours and riskier/more lethal behaviours are all associated with a higher likelihood of a future suicide attempt (Ammerman, Jacobucci, Kleiman, Uyeji, & McCoskey, 2018).

Assessing for the presence of comorbid psychiatric disorders and personality traits would also enable a more comprehensive understanding of those who may be at a particularly elevated risk of engaging in self-injurious behaviours. Similarly, obtaining information on levels of social support, social connectedness, perceived burdensomeness, a sense of meaning in life, interpersonal and/or attachment difficulties, emotional regulation difficulties, non-abusive traumatic events/life events, education/employment status, perceived self-efficacy and physical health status will also be beneficial. Moreover, assessing for contextual information in childhood such as the presence of stressful life events, parental/sibling illness, parental conflict, parental mental health and financial

hardship would be important. Considering these factors would enable a more comprehensive understanding of what factors, either alone or in particular combinations, may serve to increase an individual's vulnerability of engaging in self-injurious behaviours in early adulthood.

Biological factors are likely to be operating either as confounders or moderators. Particularly, as the estimated genetic heritability of depression in young adults is ~40%, the heritability of substance use dependence ranges between 25% - 80% and the estimated genetic heritability of non-suicidal and suicidal self-injurious behaviours have been found to be high (~50% -70%) especially for females (Corfield, et al, 2017; Kendler, Karkowski, Neale, & Prescott, 2000; Althoff, Hudziak, Willemsen, Hudziak, Bartels, & Boomsma, 2012). Furthermore, research also indicates that those who are predisposed to depression are also likely to be at an increased vulnerability for experiencing suicidal ideation and engaging in suicidal behaviours (Maciejewski et al, 2017). Importantly, parental psychopathology, substance use and parental separation are all factors that have been found to be associated with an increased risk of a child being exposed to maltreatment. Therefore, it is likely that children at a higher genetic risk for depression, substance use and self-injurious behaviours exposed to abuse may be significantly more vulnerable than children at a lower genetic risk and may also be more likely to develop a combination of these adverse outcomes. Given this, future research should endeavour to consider both genetic and environmental factors that may be implicated in the relationship between childhood emotional abuse and later self-injurious behaviours (Bellis, & Zisk, 2014).

Finally, a majority of those who experience maltreatment in childhood are likely to experience negative repercussions both in childhood and adulthood, but not all do (Cicchetti, 2013). Encouragingly, research does suggest that some individuals do thrive

despite having endured abusive experiences in childhood (Kalisch et al, 2017). Therefore, it would be valuable to identify factors that may attenuate risks and increase resilience. This may include investigating factors such as, peer relationships in childhood, self-esteem, coping skills, the quality of family relationships, friendships, personality styles and wider community resources (Marriot, Hamilton-Giachritsis, & Harrop, 2014; Collishaw, Pickles, Messer, Rutter, Shearer, & Maughan, 2007; Davey, Eaker, & Walters, 2003).

Conclusions

The current study aimed to obtain an enhanced understanding of the relationship between childhood emotional abuse and subsequent self-injurious behaviours in early adulthood. Findings revealed both direct and indirect pathways from childhood emotional abuse to self-injurious behaviours in early adulthood. In particular, the current study demonstrated that childhood emotional abuse increases the likelihood of self-injurious behaviours in early adulthood, both directly and in combination with other factors, themselves made more likely by childhood emotional abuse, which together increase this risk further. The current study had a number of significant limitations, however, so further work is required to establish the validity of the current findings.

In conclusion, the current findings although exploratory, underscore the importance of assessing for the presence of childhood emotional abuse when young adults present to mental health services. They also highlight the need for future research to identify key underlying mechanisms, such as emotional dysregulation and insecure attachments, which would inform the development of targeted interventions. Crucially, however, the current study highlights the importance of developing wider public health initiatives to reduce the incidence of and resulting deleterious consequences of childhood emotional abuse.

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Appendix I – Ethical Approval

Research Ethics
Office

Franklin Wilkins Building
5.9 Waterloo Bridge Wing
Waterloo Road
London SE1 9NH
Telephone 020 7848 4020/4070/4077
rec@kcl.ac.uk



Jithani Lennox

11 June 2019

Dear Jithani,

LRS-18/19-11985 The associations between childhood emotional abuse, depression, substance use and suicide behaviours in early adulthood. Thank you for submitting your application for the above project. I am pleased to inform you that full approval has been granted by the PNM REP.

Ethical approval has been granted for a period of three years from 11 June 2019. You will not be sent a reminder when your approval has lapsed and if you require an extension you should complete a modification request, details of which can be found here:

<https://internal.kcl.ac.uk/innovation/research/ethics/applications/modifications.aspx>

Please ensure that you follow the guidelines for good research practice as laid out in UKRIO's Code of Practice for research: <https://www.kcl.ac.uk/research/support/integrity-good-conduct/index.aspx>

Any unforeseen ethical problems arising during the course of the project should be reported to the panel Chair, via the Research Ethics Office.

Please note that we may, for the purposes of audit, contact you to ascertain the status of your research. We wish you every success with your research.

Yours sincerely,
Mr James Patterson
Senior Research Ethics Officer For and on behalf of:
PNM Research Ethics Panel

PNM Research Ethics Panel

Appendix II – ALSPAC data handling agreement



ALSPAC
Bristol Medical School
Oakfield House, Oakfield Grove
Bristol, BS8 2BN

www.alspac.bristol.ac.uk

ALSPAC Data User Responsibilities Agreement

Please complete all the following boxes:

Name:	Dr Myrathi Lennox	Institution:	Institute of Psychiatry, Psychology & Neuroscience, King's College London
Email:	myrathi.lennox@kcl.ac.uk		
B number:	B0877	Date project approved:	01/01/2018
Project title:	The psychosocial and nutritional context of early onset conduct problem children		
Project end date:	31/12/2024	Role within project:	Research student (DClinPsy)
Institutional information security policy link:	http://www.kcl.ac.uk/gov/academic/InformationPolicies/Information-security-policy.aspx		

The information obtained by ALSPAC has been given by the study participants on the understanding that it will be treated confidentially and anonymously. The ALSPAC Access Policy, available on the ALSPAC website, provides more detail and is referred to in the following agreement. For each point below please delete as appropriate (note that NA means 'Not Applicable') and sign the form to indicate that you will abide by the following:

- I will not share my dataset with anyone, including other researchers except those named on the proposal form and approved by the ALSPAC executive for this particular project. Yes/No
- I will only use my dataset for the approved purpose covered by the ALSPAC project B number above. I will submit an amendment if I wish to extend the scope of the project. I will not attempt to match my dataset with any other that may have been provided by ALSPAC for previous projects. Yes/No
- I will not try to identify any study participants. I will notify ALSPAC immediately if I inadvertently identify an individual and I will not attempt to contact that individual. Yes/No
- If my project involves potentially identifying data, I understand that the data will only be released using ALSPAC's split stage protocol. I confirm I have read and understand the procedures for this process stated in the Access Policy (see Appendix Three). Yes/No/NA
- Prior to submission of any papers for publication, I will complete a papers checklist and submit it, along with the manuscript to the ALSPAC executive for approval. I will do this at least two weeks prior to journal submission. Yes/No
- I will securely destroy any ALSPAC datasets when my approved project ends. Yes/No
- I understand that the University of Bristol owns the ALSPAC resource and any derivations from it (see Appendix Four of the Access Policy). Prior to destruction I will return my dataset to ALSPAC, together with the scripts/syntax and relevant documentation required to generate derivations. The documentation will be sufficient for someone else to understand and replicate my analyses. Yes/No
- If my dataset contains data from linked third party records, I will comply with any additional instructions as provided by ALSPAC. Yes/No/NA

DURA

Version 1.1
CONFIDENTIAL

26th July 2018

- | | |
|---|--------|
| 9. I will adhere to relevant data protection legislation, including the EU General Data Protection Regulation (https://www.eugdpr.org/) and UK Data Protection Bill 2018 | Yes/No |
| 10. I will notify ALSPAC in advance, if not already agreed, when any datasets are required to be transferred across any country's borders that are not within the European Economic Area (EEA) | Yes/No |
| 11. I have read Appendix Five in the Access Policy regarding 'Information security controls' and will comply. Please note the requirements that that all hardware storage must be encrypted and kept with you at all times or be in a securely locked location. | Yes/No |
| 12. I understand that ALSPAC will maintain a record of my contact details in order to contact me about my use of the data. | Yes/No |
| 13. I consent to ALSPAC using my contact details in order to provide ongoing news about the ALSPAC research study in the future. | Yes/No |

Signature: 

Date: 11/02/2019

Your use of ALSPAC data is controlled by the terms of a legally binding contract [or your University of Bristol contract of employment if you are a UoB employee]. Failure to abide by the above rules could result in exclusion of your institution (or yourself if you are a UoB employee) from further access to ALSPAC data and you will be subject to all appropriate sanctions, where applicable.

Please return your completed form to your assigned data buddy

The ALSPAC privacy notice is available at <http://www.bristol.ac.uk/alspac/participants/privacy/>

Appendix III – Included emotional abuse variables

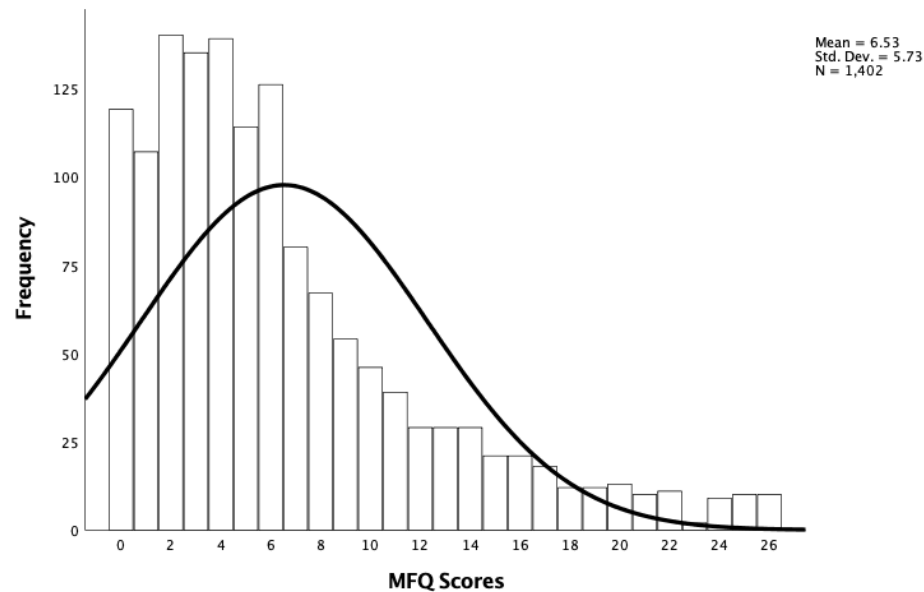
Table 6: Extracted childhood emotional abuse variables

Time point (Age)	Description of question
Less than one year	
8 weeks	• Partner was emotionally cruel to child
8 months	• Partner was emotionally cruel to child since they were born
8 months	• Mum was emotionally cruel to child since they were born
One year and above	
1 year and 9 months	• Partner was emotionally cruel to children since child was 18 months
1 year and 9 months	• Mum was emotionally cruel to children since child was 18 months
1 year and 9 months	• Partner was emotionally cruel to child
1 year and 9 months	• Mum was emotionally cruel to child
Two years and above	
2 years and 9 months	• Partner was emotionally cruel to children since child was 18 months
2 years and 9 months	• Mum was emotionally cruel to children since child was 18 months
Three years and above	
3 years and 11 months	• Partner was emotionally cruel to children since child was 30 months
3 years and 11 months	• Mum was emotionally cruel to children since child was 30 months
Five years and above	
5 years and 1 months	• Mother's partner was emotionally cruel to children in past year
5 years and 1 months	• Mother was emotionally cruel to children in past year
Six years and above	
6 years and 1 months	• Respondent's partner was emotionally cruel to children since child's 5th birthday
6 years and 1 months	• Respondent was emotionally cruel to children since child's 5th birthday
Nine years and above	
9 years and 2 months	• Mother's partner was emotionally cruel to children since child's 6th birthday
9 years and 2 months	• Mother was emotionally cruel to children since child's 6th birthday
Eleven years and above	
11 years and 2 months	• Respondent's partner was emotionally cruel to children since child's 9th birthday
11 years and 2 months	• Respondent was emotionally cruel to children since child's 9th birthday
11 years and 2 months	• Respondent's partner was emotionally cruel to children since child's 9th birthday
11 years and 2 months	• Respondent was emotionally cruel to children since child's 9th birthday

Appendix IV: Descriptive statistics for the Moods and Feelings Questionnaire

Data was available for a total of 1402 participants and analyses revealed that the scores on the MFQ ranged from the minimum 0 to the maximum possible score of 26. Furthermore, the mean score was 6.53 (SD = 5.73). The majority of the sample (83.2%) scored below the threshold score of 12 on the MFQ measure. This finding is also illustrated by the skewness score of 1.32, which indicates that the data is highly skewed. Please see Graph 1 for a distribution of the MFQ scores across the current sample.

Graph 1 – Histogram of MFQ scores across the current sample



Appendix V: A - Results from the analyses investigating predictors of non-suicidal self-injury in early adulthood

Model building

Model 0: emotional abuse

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	6.367	1	.012
	Block	6.367	1	.012
	Model	6.367	1	.012

Model 1: Emotional abuse and depression at age 18

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	66.500	1	.000
	Block	66.500	1	.000
	Model	72.867	2	.000

The addition of depression at age 18 to the original model improved the fit of the model, so was retained.

Model 2: Emotional abuse, depression at age 18 and substance use at age 18

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	34.932	1	.000
	Block	34.932	1	.000
	Model	107.799	3	.000

The addition of substance use at age 18 to the model with emotional abuse and depression at age 18 improved the fit of the model, so was retained. Therefore, the final model included the following variables: emotional abuse, depression at age 18 and substance use at age 18.

Unadjusted model: emotional abuse, depression at age 18 and substance use at age 18

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1344.199a	.074	.115

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	1.759	3	.624

Classification Table a

		Observed	Predicted		
			Non-Suicidal Self Injury at age 20		
			Not reported	Reported NSSI	Percentage Correct
Step 1	Non-Suicidal Self Injury at age 20	Not reported	1059	48	95.7
		Reported NSSI	247	51	17.1
	Overall Percentage				79.0

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1a	Emotional abuse reported in childhood (up to the age of 12.5 years)(1)	.202	.182	1.232	1	.267	1.223	.857	1.746
	MFQ score (less than 12 vs. more than 12 at age 18 (1)	1.285	.157	67.220	1	.000	3.613	2.658	4.912
	No vs. any drug use at age 18 (1)	.810	.137	34.920	1	.000	2.247	1.718	2.940
	Constant	-1.968	.106	347.075	1	.000	.140		

a. Variable(s) entered on step 1: Emotional abuse reported in childhood (up to the age of 12.5 years), MFQ score (less than 12 vs. more than 12 at age 18 , No vs. any drug use at age 18 .

Adjusted model: emotional abuse, depression at age 18 and substance use at age 18

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	128.082	7	.000
	Block	128.082	7	.000
	Model	128.082	7	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1323.916a	.087	.135

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

	Chi-square	df	Sig.
Step 1	3.789	8	.876

Classification Table^a

		Predicted			
		Non-Suicidal Self Injury at age 20		Percentage Correct	
Step 1	Observed	Not reported	Reported NSSI		
		Non-Suicidal Self Injury at age 20	Not reported	1071	36
		Reported NSSI	255	43	14.4
	Overall Percentage				79.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1a	Emotional abuse reported in childhood (up to the age of 12.5 years)(1)	.209	.184	1.295	1	.255	1.233	.860	1.769
	MFQ score (less than 12 vs. more than 12 at age 18 (1))	1.184	.160	54.809	1	.000	3.268	2.389	4.472
	No vs. any drug use at age 18 (1)	.837	.139	36.485	1	.000	2.309	1.760	3.030
	Gender of study child(1)	-.596	.160	13.881	1	.000	.551	.403	.754
	Ethnicity of study child(1)	-.077	.389	.039	1	.843	.926	.431	1.986
	Summed score of factors commonly associated with an increase in maltreatment	.078	.078	1.018	1	.313	1.081	.929	1.259
	Combined social class score (highest)	.096	.068	1.987	1	.159	1.101	.963	1.258
	Constant	-2.095	.443	22.373	1	.000	.123		

a. Variable(s) entered on step 1: Emotional abuse reported in childhood (up to the age of 12.5 years), MFQ score (less than 12 vs. more than 12 at age 18 , No vs. any drug use at age 18 , Gender of study child, Ethnicity of study child, Summed score of factors commonly associated with an increase in maltreatment, Combined social class score (highest).

Final Model: emotional abuse, depression at age 18 and substance use at age 18

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	128.082	7	.000
	Block	128.082	7	.000
	Model	128.082	7	.000

Hosmer and Lemeshow Test

		Chi-square	df	Sig.
Step 1		3.789	8	.876

Classification Table ^a

		Observed	Predicted		Percentage Correct
			Non-suicidal self-injury at age 20		
			Not reported	Reported NSSI	
Step 1	Non-suicidal self-injury at age 20	Not reported	1071	36	96.7
		Reported NSSI	255	43	14.4
		Overall Percentage			79.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1^a	Emotional abuse reported in childhood (up to the age of 12.5 years)(1)	.209	.184	1.295	1	.255	1.233	.860	1.769
	MFQ score (less than 12 vs. more than 12 at age 18 (1))	1.184	.160	54.809	1	.000	3.268	2.389	4.472
	No vs. any drug use at age 18 (1)	.837	.139	36.485	1	.000	2.309	1.760	3.030
	Gender of study child(1)	-.596	.160	13.881	1	.000	.551	.403	.754
	Ethnicity of study child(1)	-.077	.389	.039	1	.843	.926	.431	1.986
	Summed score of factors commonly associated with an increase in maltreatment	.078	.078	1.018	1	.313	1.081	.929	1.259
	Combined social class score (highest)	.096	.068	1.987	1	.159	1.101	.963	1.258
	Constant	-2.095	.443	22.373	1	.000	.123		

- a. Variable(s) entered on step 1: Emotional abuse reported in childhood (up to the age of 12.5 years), MFQ score (less than 12 vs. more than 12 at age 18, No vs. any drug use at age 18, Gender of study child, Ethnicity of study child, Summed score of factors commonly associated with an increase in maltreatment, Combined social class score (highest).

Bootstrap for Variables in the Equation

		Bootstrap^a					
		B	Bias	Std. Error	Sig. (2-tailed)	BCa 95% Confidence Interval	
						Lower	Upper
Step 1	Emotional abuse reported in childhood (up to the age of 12.5 years)(1)	.209	-.003	.193	.291	-.197	.566
	MFQ score (less than 12 vs. more than 12 at age 18 (1))	1.184	.003	.164	.001	.850	1.498
	No vs. any drug use at age 18 (1)	.837	.009	.144	.001	.548	1.135
	Gender of study child(1)	-.596	-.008	.154	.001	-.932	-.316
	Ethnicity of study child(1)	-.077	.030	.425	.845	-.854	.904
	Summed score of factors commonly associated with an increase in maltreatment	.078	.000	.077	.312	-.067	.226
	Combined social class score (highest)	.096	.002	.069	.160	-.035	.244
	Constant	-2.095	-.044	.472	.001	-3.030	-1.328

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples.

Appendix V: B - Results from the analyses investigating predictors of a suicide attempt in early adulthood

Model building

Model 0: emotional abuse

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	11.207	1	.001
	Block	11.207	1	.001
	Model	11.207	1	.001

Model 1: emotional abuse and depression at age 18

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	9.079	1	.003
	Block	9.079	1	.003
	Model	20.286	2	.000

The addition of depression at age 18 to the original model improved the fit of the model, so was retained.

Model 2: emotional abuse, depression at age 18 and substance use at age 18

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	1.193	1	.275
	Block	1.193	1	.275
	Model	21.479	3	.000

The addition of substance use at age 18 to the model with emotional abuse and depression at age 18 did not improve the fit of the model, so was not retained.

Model 3: Model 3: emotional abuse, depression at age 18 and non-suicidal self-injury at age 20

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	45.797	3	.000
	Block	45.797	3	.000
	Model	45.797	3	.000

The addition of non-suicidal self-injury at age 20 to the model with emotional abuse and depression at age 18 improved the fit of the model, so was retained. Therefore, the final model included the following variables: emotional abuse, depression at age 18 and non-suicidal self-injury at age 20.

Unadjusted model: emotional abuse, depression at age 18 and non-suicidal self-injury at age 20

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	45.797	3	.000
	Block	45.797	3	.000
	Model	45.797	3	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	188.990a	.032	.208

a. Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	.327	3	.955

Classification Table ^a

		Observed	Predicted		Percentage Correct
			Self-reported suicide attempt between 22-23 years		
			No attempt reported	Attempt reported	
Step 1	Self-reported suicide attempt between 22-23 years	No attempt reported	1382	0	100.0
		Attempt reported	23	0	.0
	Overall Percentage				98.4

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1a	Emotional abuse reported in childhood (up to the age of 12.5 years)(1)	1.242	.445	7.772	1	.005	3.462	1.446	8.287
	MFQ score (less than 12 vs. more than 12 at age 18 (1))	.724	.451	2.577	1	.108	2.063	.852	4.993
	Non-Suicidal Self Injury at age 20(1)	2.385	.527	20.505	1	.000	10.864	3.869	30.505
	Constant	-5.820	.486	143.562	1	.000	.003		

a. Variable(s) entered on step 1: Emotional abuse reported in childhood (up to the age of 12.5 years), MFQ score (less than 12 vs. more than 12 at age 18, Non-Suicidal Self Injury at age 20.

Adjusted model: emotional abuse, depression at age 18 and non-suicidal self-injury at age 20

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	52.515	7	.000
	Block	52.515	7	.000
	Model	52.515	7	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	182.272a	.037	.238

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	7.862	8	.447

Classification Table ^a

		Observed	Predicted		Percentage Correct
			Self-reported suicide attempt between the age of 22-23 years		
			No attempt reported	Attempt reported	
Step 1	Self-reported suicide attempt between the age of 22-23 years	No attempt reported	1382	0	100.0
		Attempt reported	23	0	.0
	Overall Percentage				

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Emotional abuse reported in childhood (up to the age of 12.5 years)(1)	1.153	.456	6.401	1	.011	3.166	1.297	7.733
	MFQ score (less than 12 vs. more than 12 at age 18 (1))	.607	.469	1.674	1	.196	1.835	.732	4.601
	Non-Suicidal Self Injury at age 20(1)	2.404	.534	20.295	1	.000	11.071	3.889	31.512
	Gender of study child(1)	.341	.495	.474	1	.491	1.406	.533	3.711
	Ethnicity of study child(1)	16.733	5629.043	.000	1	.998	18500725.050*	.000	.
	Summed score of factors commonly associated with an increase in maltreatment	.413	.218	3.609	1	.057	1.512	.987	2.316
	Combined social class score (highest)	.068	.207	.108	1	.743	1.070	.713	1.607
	Constant	-23.318	5629.043	.000	1	.997	.000		

- a. a. Variable(s) entered on step 1: Emotional abuse reported in childhood (up to the age of 12.5 years), MFQ score (less than 12 vs. more than 12 at age 18, Non-Suicidal Self Injury at age 20, Gender of study child, Ethnicity of study child, Summed score of factors commonly associated with an increase in maltreatment, Combined social class score (highest).

**This figure is due to the very small number of participants self-identifying as being from a Black or Ethnic Minority background.*

Final Model: emotional abuse, depression at age 18 and non-suicidal self-injury at age 20

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	52.515	7	.000
	Block	52.515	7	.000
	Model	52.515	7	.000

Hosmer and Lemeshow Test

		Chi-square	df	Sig.
Step 1		7.862	8	.447

Classification Table ^a

Observed		Predicted			
		Self-reported suicide attempt between the ages of 22-23 years		Percentage Correct	
		No attempt reported	Attempt reported		
Step 1	Self-reported suicide attempt between the age of 22-23 years	No attempt reported	1382	0	100.0
		Attempt reported	23	0	.0
Overall Percentage					98.4

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1^a	Emotional abuse reported in childhood (up to the age of 12.5 years)(1)	1.153	.456	6.401	1	.011	3.166	1.297	7.733
	MFQ score (less than 12 vs. more than 12 at age 18 (1))	.607	.469	1.674	1	.196	1.835	.732	4.601
	Non-suicidal self-injury/ self-harm at age 20(1)	2.404	.534	20.295	1	.000	11.071	3.889	31.512
	Gender of study child(1)	.341	.495	.474	1	.491	1.406	.533	3.711
	Ethnicity of study child(1)	16.733	5629.043	.000	1	.998	18500725.050*	.000	.
	Summed score of factors commonly associated with an increase in maltreatment	.413	.218	3.609	1	.057	1.512	.987	2.316
	Combined social class score (highest)	.068	.207	.108	1	.743	1.070	.713	1.607
	Constant	-23.318	5629.043	.000	1	.997	.000		

b. Variable(s) entered on step 1: Emotional abuse reported in childhood (up to the age of 12.5 years), MFQ score (less than 12 vs. more than 12 at age 18, Non-suicidal self-injury/ self-harm at age 20, Gender of study child, Ethnicity of study child, Summed score of factors commonly associated with an increase in maltreatment, Combined social class score (highest).

**This figure is due to the very small number of participants self-identifying as being from a Black or Ethnic Minority background.*

Bootstrap for Variables in the Equation

		Bootstrap ^a					BCa 95% Confidence Interval	
		B	Bias	Std. Error	Sig. (2-tailed)	Lower	Upper	
Step 1	Emotional abuse reported in childhood (up to the age of 12.5 years)(1)	1.153	.005	.502	.010	.156	2.143	
	MFQ score (less than 12 vs. more than 12 at age 18 (1))	.607	-.005	.532	.220	-.446	1.595	
	Non-suicidal self-injury/ self-harm at age 20(1)	2.404	.242	1.699	.001	1.138	9.946	
	Gender of study child(1)	.341	-.080	1.101	.533	-.929	1.259	
	Ethnicity of study child(1)	16.733	-.092	.418	.001	15.926	17.243	
	Summed score of factors commonly associated with an increase in maltreatment	.413	.014	.220	.047	-.096	.910	
	Combined social class score (highest)	.068	.002	.198	.722	-.326	.456	
	Constant	-23.318	-.301	1.799	.001	-25.230	-22.151	

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples.