Midlife Emotional, Physical and Substance Use Outcomes Following a Childhood in the Public Care System

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Table of Contents

Executive Summary

‘Looked after’ was the term coined by the Department of Health to describe children in public care. This included those residing with their birth parents but subject to care orders, as well as those in foster or residential homes. The most common reasons for placement in public care included abuse and neglect. A total of 72,670 looked after children were recorded in March 2017 (Department for Education [DoE], 2017).

The aim of this thesis was firstly to synthesise the existing literature examining foster and adoptive family interventions on the parent-child relationship and secondly to look at existing data on the long-term psychosocial outcomes for children who spent time in public care. This summary aims to provide a holistic overview of the thesis.

Children in public care have been found to have higher rates of mental health difficulties compared to children who live with their birth parents (Ford, Vostanis, Meltzer, Goodman, & Ord, 2007). For the majority of young people these emotional and behaviour difficulties are apparent prior to entry into public care (Sempik, Ward, & Darker, 2008) and these difficulties have been shown to persist through transitioning out of care to early adulthood (e.g. Buehler, Orme, Post, & Patterson, 2000; Dregan, Brown, & Armstrong, 2011).

The ability to build a secure attachment to a primary caregiver has been shown to be a protective factor against later-life emotional difficulties and essential for successful development into adulthood (Bowlby, 1969). Secure attachments are made

possible when parenting is sensitive, consistent and responsive. The child feels safe to explore their surroundings and returns to the caregiver when frightened or stressed (Ainsworth, Blehar, Waters & Wall, 1978). Children who experience absent, frightening or inconsistent parenting are more likely to develop disorganised attachment styles (Main & Solomon, 1990). These children might display behaviours such as freezing, confusion, apprehension and stereotyped manners. Disorganised attachment behaviours have been found to be as high as 90% in children in public care (Cicchetti, Rogosch, & Toth, 2006).

The age the child is placed in care and the importance the carer places on the attachment relationship are two of the factors that predict whether the child becomes securely attached (Dozier, Stovall, Albus, & Bates, 2001; Stovall-McClough & Dozier, 2004). Research has found that the behaviours of children in care, such as withdrawal, can be difficult for carers to understand and often elicit feelings such as impatience. It is understandable that, without adequate training for example a withdrawal response, is confusing for caregivers. The aim of training programmes is to provide carers with an understanding of the early-life adversity and the subsequent attachment behaviours of the children they are caring for. This in turn can help them to make sense of these behaviours and monitor their own responses.

Young people who have left care place a large importance on the caregiver-child relationship and The National Institute for Health and Clinical Excellence (NICE, 2010) recommends that attachment-based interventions should be available for young people and their families. Interventions using an attachment model are growing in number but there is limited evidence around their efficacy. This systematic review built on previous research by incorporating the breadth of the parent-child relationship, rather than being limited to studies concerned only with attachment. The aim was to systematically review the literature that examined the efficacy of family and parenting interventions, for both foster carers and adoptive parents, on the parent-child relationship.

Pre-selected search terms were used to identify articles in PubMed, PsycINFO and Medline databases. Non-peer reviewed articles were searched through ProQuest's Dissertation and Theses Database. Articles were included if they used a Randomised Control Trial (RCT) or quasi-experimental design, looked at pre- and post-test interventions, compared groups and measured the parent-child relationship. Collectively the databases identified 2551 articles. After duplicates were removed, the abstracts of 2363 articles were screened in accordance with the inclusion and exclusion criteria. 105 full articles were assessed for eligibility leaving 18 studies to be included in the review. The search collated studies that used a range of interventions and outcome measures. A narrative review, where the various outcomes from each study are described and evaluated, was conducted and the methodological quality of each study was assessed using the Cochrane Handbook's Risk of Bias Tool.

Of the 18 studies, 12 found at least one significant finding on the parent-child relationship outcome measures they used, in favour of their intervention group. However, six of the studies found no significant effects. The studies that found significant effects indicate some improvements in sensitivity, avoidance, empathy, attachment and parent-child dysfunction. However, the high risk of bias across all of the studies, the lack of transparent reporting and the wide variety of outcome measures included made it difficult to evaluate how effective these interventions were for improving the parent-child relationship. The tentative conclusions of improvements in sensitivity, avoidance, empathy, attachment and parent-child dysfunction should be interpreted with caution.

Given that the systematic review found that parenting and family interventions that aimed to repair the effects of early-life maltreatment did not show consistent efficacy, it is possible that negative effects from early-life adversity might be sustained indefinitely. To further analyse these findings, the empirical study looked at the long-term impact of children who had been in public care.

Longitudinal studies have had the opportunity to follow large cohorts of individuals who spent time in public care, providing a robust method of examining the lifetime trajectory of these young people. Children in care have been shown to have higher rates of mental health problems, behaviour and interpersonal difficulties, as well as lower education attainment and more frequent contact with the criminal justice system (Ford, Vostanis, Meltzer, Goodman, & Ord, 2007; Minnis, Everett, Pelosi, Dunn, & Knapp, 2006). Higher rates of emotional and behavioural problems continue to be evident upon leaving care and the literature following these children to age 33 has demonstrated that these difficulties continue into adulthood (Buehler et al., 2000; Dregan et al., 2011).

While the majority of findings show enduring difficulties, this does not appear to be true for alcohol use. While drug and alcohol use was higher for adolescents in public care and for care leavers (Barth, 1990; English & Grasso, 2000; Mendes & Badal, 2006), this appears to decrease over time. At age 33, adults who had been in public care as children were no more likely than children who had not been in care to misuse alcohol (Dregan et al., 2011).

One of the main limitations of previous longitudinal studies was the lack of transparent management of the high attrition rates inherent in longitudinal data. With these limitations in mind, the empirical study set out to answer the following questions: Does childhood public care predict higher levels of self-reported malaise, rates of smoking, lower levels of quality of life, mental health and physical health functioning, poorer self-efficacy skills, lower relationship and life satisfaction at age 50? Do alcohol problems continue to be insignificantly different between those who spent time in public care and those who did not?

Data from the National Child Development Study 1958 (NCDS1958) was used in this study. This study examined data collected when the cohort members were age 7, 11, 16, 23 and at age 50. A total of 863 cohort members were identified as young people who were in public care. The comparison group included all individuals who had not been placed in public care.

A number of factors were used to adjust for background differences between the public care and non-public care groups. These factors included gender, ethnicity, social status, maternal smoking during pregnancy and birth weight. At age 50 the following outcomes measures were used: The Malaise Inventory, an indicator of depressive symptoms; the Physical Functioning and Mental Health subscales from the Short Form 36 Items Health Survey, a measure of quality of life, self-efficacy, life satisfaction, relationship satisfaction, alcohol use and smoking status.

The results established that, compared to those who had not spent time in care, being in care predicted higher levels of malaise, higher likelihood of smoking, poorer physical functioning, poorer mental health, poorer quality of life, lower life satisfaction and lower relationship satisfaction at age 50.. These predictors remained significant after controlling for other covariates from early-life, including gender, ethnicity, birth weight, social class, mother smoking during pregnancy and being breastfed. These findings are largely in line with previous work that followed a cohort to age 33 and demonstrated the predictive nature of care status on later-life depression, life satisfaction and smoking status (Dregan et al., 2011).

Being in care was not predictive of harmful alcohol use at age 50. This is in line with evidence at age 30, where individuals who had been in care did not score any worse than those who had not been in care (Dregan et al., 2011). It suggests that harmful alcohol use is not a pervasive difficulty for those who have spent time in care and, rather, research has shown that personality traits, such as higher sensation seeking, impulsivity and lower constraint are responsible for persistent alcohol misuse (Bennett, McCrady, Johnson, & Pandina, 1999; Chassin, Pitts, & Prost, 2002; Hill, White, Chung, Hawkins, & Catalano, 2000).

In contrast to Dregan et al. (2011), the results showed that care was not predictive of low self-efficacy skills at age 50. While self-efficacy has been shown to predict a number of health behaviours (Baldwin, 2006; Oei & Burrow, 2000), there is relatively little knowledge about how self-efficacy changes over time (Ashford, Edmunds, & French, 2010). We could hypothesise that, for those in care, self-efficacy skills take longer to develop. It is possible that over time there are more opportunities to attribute positive experiences to autonomous capabilities and therefore self-efficacy skills improve across the course of adult life. Conversely, it is also possible that self-efficacy skills for those who did not spend time in care diminish before age 50.

It is important that these findings are considered with caution and that the modest associations should be taken into account. The predictive nature of care status on later-life difficulties is not dissimilar to a range of other predictive factors, including gender, ethnicity, social class, mother smoking during pregnancy and being breastfed. In addition, these findings do not show that being in care causes the outcomes at age 50. Given that we know the most common reasons for being placed in public care include abuse and neglect (House of Commons, 2015), it is also plausible that the public care measure in the current study is indicative of some degree of early-life adversity. In line with evidence that found children in care had rates of disorganised attachment of up to 90%, it is likely that rates of disorganised attachment are higher in this sample at age 50 compared to those who have not been in care. This might account for and explain some of the difficulties in later-life (Cicchetti et al., 2006).

Collectively the two studies have a number of clinical applications. The inconclusive results from the systematic review point to the need for a consensus over appropriate, standardised outcome measures for measuring the parent-child relationship. While NICE recommend attachment-based interventions, it lacks clarity on the types of interventions. It would be important for policy-makers to fund high-quality research that looks at the development of parent-child relationships and long-term follow up on their attachment styles.

The findings from the empirical study suggest that more attention is needed on the well-being of people who were in public care as children, not only at age 50 but from childhood through to adult life. Clinicians should make themselves aware of the early experiences of their clients and ensure that time spent in care plays a part of the formulation of their difficulties. Future work could build on this and focus on understanding and recording why young people go into care. This might help tailor interventions depending on early-life experiences. While public care might be different in the present day it is only in more recent years that preventing or reversing the effects of childhood adversity has been high on the agenda for policy-makers and those in public services. It is important that we learn from longitudinal studies such as the current study and work to reduce the rates of abuse and neglect in early-life and provide greater input to support parent and carers to evaluate whether it is possible to improve the outcomes for this group of individuals.

The Effectiveness of Parenting and Family Interventions for Foster Carers and Adoptive Parents on the Parent-Child Relationship: A Systematic Review

Abstract

Healthy attachments to a caregiver have been shown to be a major protective factor against later-life emotional difficulties. However, children in care have much higher rates of attachment difficulties compared to those children who are not in public care. This study aimed to systematically review quantitative studies that evaluated the parent-child relationship following foster carer, adoptive parent or family interventions.

The initial search identified 2,551 articles. Following the removal of duplicates, 2,363 articles were considered for inclusion if they: i) used a pre- post-test Randomised Control Trial or quasi-experimental design, ii) measured the child-parent relationship and, iii) compared groups. A total of 18 studies met these criteria. Their data were extracted and the Cochrane Handbooks' Risk of Bias Tool was used to assess methodological quality.

Of the 18 studies, 12 of them found at least one significant finding in terms of the parent-child relationship outcome, in favour of the intervention group. The studies indicate some improvements in sensitivity, avoidance, empathy, attachment and parent-child dysfunction but the high risk of bias across all of the studies renders the findings inconclusive.

Future research should identify appropriate and uniform outcome measures and use these to focus on high-quality studies looking at the short and long-term benefits of effective interventions for this at risk group.

Introduction

Of the 72,670 looked after Children in the UK in 2017 (DoE, 2017), 74% are placed in foster care. The number of looked after children placed in care has increased year on year with a 3% rise since 2016 (DoE, 2017). In England the majority of young people in care are white British, male and aged between 10 and 15 years. Black or Black British and Mixed groups are overrepresented in care and make up 16% (House of Commons, 2015).

Children can enter care for a wide range of different reasons. Abuse and neglect are the primary reasons. Others state 'family dysfunction', short breaks when either the child or parent has a severe disability, acute stress in the family, absent parenting and socially unacceptable behaviour (House of Commons, 2015). The primary reasons highlight the likely maltreatment and multiple separations experienced by a young person, prior to care. When children in public care are compared to disadvantaged children living with their birth families, children in public care are just over three times more likely to have a diagnosed mental health disorder and over five times more likely than non-disadvantaged children (Ford et al., 2007). For the majority of children in care these emotional and behavioural problems are evident prior to entry into care (Sempik et al., 2008) and have been shown to persist into early adulthood (Cheung & Buchanan, 1997; Dregan et al., 2011; Viner & Taylor, 2005).

Studies to date have discussed the importance of developing a healthy attachment and how this appears to be a major protective factor against later-life emotional difficulties (Hillmann, Neukel, Hagemann, Herpertz & Bertsch, 2016). Bowlby's proposed Attachment Theory was based on the idea that successful childhood development depended on the ability to form a strong relationship with at least one stable caregiver. This was labelled a secure attachment (Bowlby, 1969). Attachment behaviours are characterised by the need for proximity with the caregiver at times when they experience distress. A cycle of security develops when the child feels safe with their caregiver. As a result they are motivated to explore their surroundings, allowing new experiences to inform their learning of themselves, others and the world. If, however, the child becomes frightened, the child's ability to explore reduces and they are motivated to seek proximity with their secure base (Ainsworth et al., 1978).

The aforementioned secure attachment characterises the attachment relationship of 60-65% of the population who have not been in public care. Predictable, sensitive and responsive parenting where the caregiver attends to the child's varying emotional states facilitates the child's development of self-regulatory skills (Bowlby, 1988). The child builds an internal working model whereby they feel lovable, take an active role in the relationships they build and they view others as safe and available.

Other patterns of attachment have been classified as insecure-avoidant, insecure-ambivalent and disorganised (Ainsworth et al., 1978; Main & Solomon 1990). When parenting styles are inconsistent, absent or frightening, disorganised attachments develop. In these circular systems the caregiver is a source of threat and the child seeks to control the relationship in order to feel safe. They become more reliant on themselves and are unable to explore their surroundings or seek comfort from others (Lyons-Ruth, Yellin, Melnick, & Atwood, 2005). The child's internal working model identifies the self as fearful and angry and views others as frightening and dangerous. The parenting styles that give rise to disorganised attachments are commonly observed in children who have been maltreated and experienced multiple separations. In fact, disorganised attachment behaviours are evident in up to 90% of children in public care (Cicchetti et al., 2006).

There are a range of factors that impact the formation of a secure attachment in foster care. One of these factors appears to be the age at which the child is placed in care, with younger infants displaying more secure and less avoidant attachment behaviours than those placed at a slightly older age (Stovall-McClough & Dozier, 2004). Older infants, those above 12 months of age, were more likely to withdraw in response to distress. This reaction is something that some caregivers found difficult to manage and can elicit feelings of irritation and impatience. It is understandable that without adequate training a young person responding in this way would be confusing for a caregiver. Education around the traumatising upbringing of these children, their subsequent attachment behaviours are essential topics for foster carer training. The idea is that this will allow the caregiver to manage and adapt their own responses to these behaviours, with the children's history in mind. In fact, the knowledge and value the caregiver placed on the importance of attachment predicted whether the looked after child became securely attached to the caregiver (Dozier et al., 2001).

Interestingly, but somewhat unsurprisingly, young people themselves echo the already established importance of the caregiver-child relationship. An article written by the NSPCC focussing on “achieving emotional well-being for looked after children” asked individuals in care, foster carers and other professionals about their experiences of the care system (Bazalgette, Rahilly, & Trevelyan, 2015). The pertinent issues focussed on the relationship they had with their carer and the necessary knowledge and skills required for thinking about the emotional well-being of the young person. This resonated with professionals in CAMHS and both carers and social workers recognised the need for additional training and support (Bazalgette, Rahilly, & Trevelyan, 2015).

With these clear implications of understanding attachment behaviour it seems essential that effective interventions help to build the relationship between the child and caregiver. NICE (2010) recommended that young people and their parents have access to attachment-based interventions. Furthermore, all professionals that have contact with young people with potential attachment difficulties should receive appropriate training. Interventions using an attachment model that have evaluated them with a clinical sample, such as Fostering Attachments (Golding & Picken, 2004), Promoting First Relationships (PFR) (Spieker, Oxford, Kelly, Nelson, & Fleming, 2012) and Attachment and Bio-behavioural Catch up (ABC) (Bick & Dozier, 2013), are growing in number.

More recently, attachment focused interventions have been more thoroughly evaluated (Kerr & Cossar, 2014). However, the majority of these parenting interventions continue to evaluate the intervention’s efficacy on reducing difficult to manage behaviours in the home. It is understandable that the particularly elevated rates of diagnosed behavioural disorders in children in care have caught the attention of both researchers and clinicians. Concerns have stemmed from the difficulty carers have coping with challenging behaviour and the subsequent risk of foster placement breakdown (Ford et al., 2007; Rock, Michelson, Thomson, & Day, 2015). Breakdown in placements has been linked to an increase in further externalising (e.g. physical aggression, disobeying rules and stealing) and internalising (e.g. anxiety, depression and withdrawal) behaviour difficulties (Newton, Litrownik, & Landsverk, 2000). More recently, reviews of the literature have evaluated the efficacy of foster carer/parent training on child behaviour difficulties (Solomon, Niec, & Schoonover, 2017; Uretsky & Hoffman, 2017). Others have collated effective interventions for the mental health of children in care from birth to age 12 (Hambrick, Oppenheim-Weller, N'zi, & Taussig, 2016).

One of the key focuses of interventions is to reduce externalising behaviours with the aim of reducing placement breakdown. However, a large body of literature suggests that parenting interventions were more effective when the training included emotional communication skills and increasing positive carer-child interactions (Kaminski, Valle, Filene, & Boyle, 2008). The development of the relationship between the carer and child optimises the ability for the child to form a secure attachment (Van Andel et al., 2016). While there are inherent links between attachment behaviours and externalising behaviours, a focus on relationship outcomes has been relatively neglected in the literature.

Reviews to date have looked at the effectiveness of attachment interventions on a range of outcomes (Kerr & Cossar, 2014). Reviews that solely focus on interventions that develop children's relationships with their caregivers have helped to focus research on the importance of these relations. However, the research has been fairly inconclusive and there has been a failure to draw together all of the interventions available (Drozd, Bergsund, Hammerstrøm, Hansen, & Jacobsen, 2017; Wassall, 2011). Wassall (2011) focused on only peer-reviewed interventions in the UK, leading to a bias in study selection and Drozd et al., (2017) include interventions solely for adoptive parents. This makes it important to reduce publication bias where possible by including grey literature and looking at interventions for both foster carers and adoptive parents.

Methods of successfully developing the relationship between the caregiver and the child are deserving of further attention, given the growing evidence for the long-term negative effects of early-life maltreatment on adult psychopathology (Cheung & Buchanan, 1997; Dregan et al., 2011; Viner & Taylor, 2005), the promise of the remedial effects of successful attachments on early adverse experiences (Woolgar, 2013) and reviews suggesting the importance of exploring the foster parent-child relationship (Solomon et al., 2017). However, caution has been placed on how quickly children in care form new secure attachments and this poses difficulties when measuring attachment outcomes (Wassall, 2011).

The formation of secure attachments has been shown to be dependent on a number of factors. Caregiver behaviours such as sensitivity, empathy and responsiveness, which are all factors included in Ainsworth's cycle of security (Ainsworth et al., 1978), have been shown to be particularly important for children in care. A helpful systematic review conducted by Pritchett et al. (2011) organised a large number of outcome measures and characterised those that assessed the parent-child relationship. Using measures described in past research and those reviewed by Pritchett et al. (2011) this systematic review examines the efficacy of family and parenting interventions for both foster carers and adoptive parents on the parent-child relationship.

Method

Study eligibility criteria.

Using PRISMA Statement guidelines (Moher et al., 2009) for the reporting of systematic reviews, studies were included if they:

1) Used a quantitative design;
2) Were a RCT or quasi-experimental design;
3) Evaluated an intervention that included foster carers and/or adoptive parents or families. Those that included biological parents or exclusively recruited kinship parents were excluded. Multi-treatment Foster Care (MTFC) interventions were excluded;
4) Measured the child-parent relationship;
5) Compared groups; and
6) Looked at pre- and post-test measures.

Data sources.

PubMed, PsycINFO and Medline were selected as databases for peer-reviewed articles. Non-peer reviewed articles were searched through ProQuest's Dissertation and Theses Database. This was in an effort to maintain the systematic search strategy whilst reducing publication bias.

The search was restricted to studies published from 1995 up to the present day (December 2017, week 3). This was due to new legislation relating to standards of fostering care being put in place in 1999 (UK Joint Working Party on Foster Care, 1999). The 1999 legislation came into being following two years of work. Studies published from 1995 were included in this review to take account of research that may have informed the standards.

Search strategy.

All databases were searched using the following search terms (* indicates truncation): foster care*, foster parent*, adoptive parent*, adoptive famil*, looked after child*, adopted child*, foster child*, orphanage care, foster pre-schoolers, adopted infant*, state dependency and intervention*, train*, treatment, therapy, program, programme and effect*, impact, outcome*, evidence, evaluat*, results and attachment*, relation*, interaction*. All search terms were searched for in the title/abstract on PubMed and in the abstract on PsycInfo, Medline and ProQuest. Combined, the searches resulted in a total of 2,551 results to be considered for inclusion.

Data collection.

The data collection had four stages, detailed in the PRISMA diagram (Figure 1). One reviewer (RC) identified the searches using the pre-specified search criteria. Following the removal of duplicated articles the titles and abstracts were screened for eligibility. At this stage articles were considered relevant if they: a) used a quantitative design, b) used a RCT or quasi-experimental design and c) evaluated an intervention including foster carers and/or adoptive parents or families.

It was not possible to screen articles that assessed the parent-child relationship based on the title and abstracts alone. Many of the articles in this field focus on additional outcomes in the abstract and therefore the authors felt it was appropriate to examine the outcome measure during the full article screen. To ensure reliable use of the inclusion criteria a second reviewer (CB) crosschecked 20 of the original articles. Disagreements were discussed and resolved by discussion.

In the second stage the remaining articles considered relevant by either reviewer were retrieved in full. Full articles were included if a) they measured the parent-child relationship and if b) they compared groups (i.e. at least one control group) to assess the effectiveness of each training intervention. One reviewer (RC) assessed the eligibility of the articles, the second reviewer cross-checked 20 of these articles. Disagreements were discussed and resolved. Exclusions were reported with given reason and a final group of studies were included for analysis.

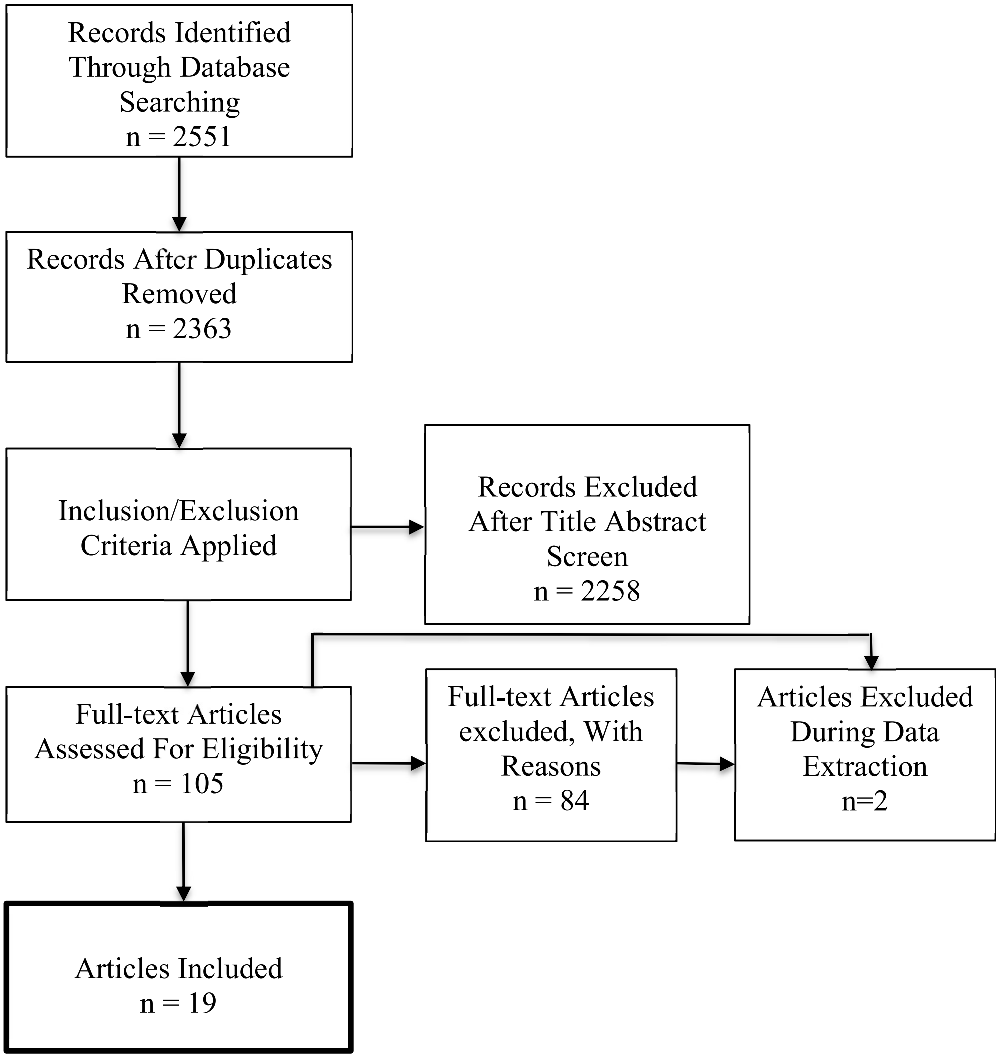

Figure 1. Study Search Process.

Data abstraction and quality assessment.

One reviewer (RC) extracted the following details from the articles: authors, date of publication, country, study design, intervention, participants/sample, setting of the intervention, details of the intervention, parent-child relationship outcome variable, outcome. A second reviewer (CB) crosschecked the data extraction and disagreements were resolved by discussion.

Methodological quality was assessed using the Cochrane Handbook's Risk of Bias Tool version 5.1.0 (Higgins & Green, 2011). The tool covers seven items: 1) random sequence generation, 2) allocation concealment, 3) blinding of participants and personnel, 4) blinding of outcome assessment, 5) incomplete outcome data, 6) selective reporting and 7) other sources of bias. Cochrane's recommendation is that each item is assessment as low risk, high risk or unclear risk. Ratings were crosschecked by a second reviewer and disagreements resolved by discussion.

Statistical analysis.

Inter-rater reliability for study eligibility was assessed from the cross-checked subsample using Cohen's Kappa.

In order to determine how effective the interventions were on the parent-child relationship, the reported mean effect size was either extracted or calculated based on the available information using Cohen's *d.* If any data was missing, the relevant authors were contacted in a request for this information. A meta-analysis was planned, however this depended on the homogeneous use of outcome variables across the studies. If the variables were heterogeneous the plan was to present a narrative summary of the included studies.

Results

Study selection and characteristics.

Following the removal of duplicates a total of 2,363 references were screened for inclusion, as per the criteria described in the method (Figure 1). A second reviewer checked the eligibility of a subsample of articles (n=20); there were strong agreements between the two reviews on eligibility (Cohen's Kappa = .77, p <.001). In total there were 18 studies (19 articles) that met the inclusion and exclusion criteria and were therefore included in this review. The search identified two articles by Minnis (Minnis, 1999; Minnis, Pelosi, Knapp, & Dunn, 2001), published initially in ProQuest's Dissertation and Theses Database and then in the Journal: Archives of Disease in Childhood. The thesis provides additional methodological information but both render the same results. Therefore one has not been excluded as a duplicate but throughout this review information from both articles have been collated and referenced as one study (Minnis et al., 2001). Summaries of the study characteristics are included in Table 1.

The studies reviewed were published between 1997 and 2016, with only one study published before the year 2000 (Juffer, Hoksbergen, Riksen-Walraven, & Kohnstamm, 1997). Nine of the studies were published between 2000 and 2010 (Becker-Weidman, 2006; Benjamin, 2010; Dozier et al., 2009; Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2005; Minnis et al., 2001; Owen, 2007; Sprang, 2009; Triantafillou, 2003; Wilson, 2006) and the remaining eight were published between 2010 and 2016 (Baker, Biringen, Meyer-Parsons, & Schneider, 2015; Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Mersky, Topitzes, Janczewski, & McNeil, 2015; Opiola, 2016; Van Andel et al., 2016; Vranjin, 2012; Wassall, 2011). In terms of the location of the research, 12 were conducted in the USA (Baker et al., 2015; Becker-Weidman, 2006; Benjamin, 2010; Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Dozier et al., 2009; Mersky et al., 2015; Opiola, 2016; Owen, 2007; Sprang, 2009; Vranjin, 2012; Wilson, 2006), three in the Netherlands (Juffer et al., 2005; Juffer et al., 1997; Van Andel et al., 2016), one in Canada (Triantafillou, 2003), one in Scotland (Minnis et al., 2001) and one in the UK (Wassall, 2011). Of these studies eight were quasi-experimental (Becker-Weidman, 2006; Benjamin, 2010; Juffer et al., 2005; Owen, 2007; Sprang, 2009; Triantafillou, 2003; Wassall, 2011; Wilson, 2006) and nine were RCTs (Baker et al., 2015; Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Dozier et al., 2009; Mersky et al., 2015; Minnis et al., 2001; Opiola, 2016; Van Andel et al., 2016; Vranjin, 2012). Two of the studies set out with an RCT design but diverted to quasi-experimental designs due to participant time constraints (Benjamin, 2010) or found that participants became acquainted with each other through the adoption process (Juffer et al., 1997). In accordance with the inclusion criteria all of the studies made use of a comparison group, eight of the studies included a wait list control group (Baker et al., 2015; Benjamin, 2010; Carnes-Holt & Bratton, 2014; Mersky et al., 2015; Owen, 2007; Vranjin, 2012; Wassall, 2011; Wilson, 2006), five of the studies had an active control group (Bick & Dozier, 2013; Dozier et al., 2009; Juffer et al., 2005, 1997; Opiola, 2016) and the remaining five studies were treatment as usual (Becker-Weidman, 2006; Minnis et al., 2001; Sprang, 2009; Triantafillou, 2003; Van Andel et al., 2016).

All studies collected outcomes pre and post intervention, six of the studies had a degree of follow-up after the intervention (Bick & Dozier, 2013; Minnis et al., 2001; Van Andel et al., 2016; Vranjin, 2012; Wassall, 2011; Wilson, 2006). One study did not specify when the follow up data was collected (Wilson, 2006). Another study made reference to a seven year follow up but this paper did not include the pre- post-test evaluation (Juffer et al., 1997; Stams, Juffer, & van Ijzendoorn, 2001).

Participants.

All studies combined, there were 1152 carers in total who participated. In general sample sizes were small, the largest total sample size was n=130 (Juffer et al., 2005) and the smallest was n=10 (Owen, 2007). Of the studies, 14 had a total sample size under 100 (Baker et al., 2015; Becker-Weidman, 2006; Benjamin, 2010; Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Dozier et al., 2009; Juffer et al., 1997; Opiola, 2016; Owen, 2007; Sprang, 2009; Triantafillou, 2003; Vranjin, 2012; Wassall, 2011; Wilson, 2006) and the remaining four had a total sample size greater than 100 (Juffer et al., 2005; Mersky et al., 2015; Minnis et al., 2001; Van Andel et al., 2016).

Of the total studies, 10 recruited only foster carers (Bick & Dozier, 2013; Dozier et al., 2009; Minnis et al., 2001; Owen, 2007; Sprang, 2009; Topitzes, Mersky, & McNeil, 2015; Triantafillou, 2003; Van Andel et al., 2016; Vranjin, 2012; Wilson, 2006), six recruited only adoptive parents (Baker et al., 2015; Benjamin, 2010; Carnes-Holt & Bratton, 2014; Juffer et al., 2005; Juffer et al., 1997; Opiola, 2016), this included parents in the process of adoption and two recruited both foster carers and adoptive parents to their studies (Becker-Weidman, 2006; Wassall, 2011).

The gender of the parent participants was reported by 12 of the studies. The gender ratio was heavily weighted towards female participants, one study consisted of all female parent participants (Bick & Dozier, 2013) and the remaining 11 had samples where more than half the participants were female (Baker et al., 2015; Benjamin, 2010; Carnes-Holt & Bratton, 2014; Dozier et al., 2009; Juffer et al., 1997; Opiola, 2016; Owen, 2007; Sprang, 2009; Topitzes et al., 2015; Vranjin, 2012;

Wassall, 2011). Age was reported by 10 of the studies (Baker et al., 2015; Benjamin, 2010; Bick & Dozier, 2013; Juffer et al., 1997; Mersky, Topitzes, Grant-Savela, Brondino, & McNeil, 2016; Minnis et al., 2001; Sprang, 2009; Vranjin, 2012; Wassall, 2011; Wilson, 2006), in these studies parents had a mean age ranging from 35 to 48 years. Of the studies, 10 reported ethnicity of the parent(s) (Baker et al., 2015; Benjamin, 2010; Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Mersky et al., 2015; Opiola, 2016; Owen, 2007; Sprang, 2009; Vranjin, 2012; Wassall, 2011b). These included Caucasian, European American, Asian, Asian American, British Asian, African American, Hispanic and Latino.

All but one study included the age of the foster/adoptive children. 8 studies included parents who had children under the age of five and a half years (Baker et al., 2015; Bick & Dozier, 2013; Dozier et al., 2009; Juffer et al., 2005, 1997; Owen, 2007; Sprang, 2009; Van Andel et al., 2016). Four studies included children from the age of 5 up to 18 (Becker-Weidman, 2006; Benjamin, 2010; Minnis et al., 2001; Triantafillou, 2003). Three of the studies included children between the age of two and 10 (Carnes-Holt & Bratton, 2014; Mersky et al., 2015; Opiola, 2016) and two of the studies covered the whole childhood age span from birth to 17 (Vranjin, 2012; Wassall, 2011b).

Nine of the studies reported the ethnicity of the children (Benjamin, 2010; Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Dozier et al., 2009; Juffer et al., 2005, 1997; Mersky et al., 2015; Owen, 2007; Wassall, 2011). Gender was reported by twelve of the studies, the ratios were more balanced than the majority female parent samples (Bick & Dozier, 2013; Juffer et al., 1997; Mersky et al., 2015; Minnis et al., 2001; Owen, 2007; Triantafillou, 2003; Van Andel et al., 2016; Wassall, 2011).

Approximately 42% of the participants were male; two studies reported a higher rate of males in the treatment condition compared to the control group (Owen, 2007; Triantafillou, 2003).

Five of the studies stated that the children had to have attachment related concerns or meet a cut off criteria on standardised measures of attachment disorder in order for the parents to be eligible for the study (Becker-Weidman, 2006; Benjamin, 2010; Carnes-Holt & Bratton, 2014; Opiola, 2016; Sprang, 2009). One study only included families whose child reached the clinical range on the Eyberg Child Behaviour Inventory (Mersky et al., 2015) and another only included families of children who were survivors of sexual abuse (Vranjin, 2012).

Care information.

Of the total studies, only four stated the number of previous placements (Baker et al., 2015; Minnis et al., 2001; Triantafillou, 2003; Wassall, 2011) this ranged from being adopted at birth to more than five different placements. Six of the studies stated the time the children had spent in their current placement (Becker-Weidman, 2006; Minnis et al., 2001; Opiola, 2016; Triantafillou, 2003; Vranjin, 2012; Wassall, 2011) and this varied hugely, especially in one study where children had been in their current placement from five days up to five years (Vranjin, 2012). Four of the studies provided reasons for children being taken into public care (Baker et al., 2015; Minnis et al., 2001; Vranjin, 2012; Wassall, 2011); reasons included utero-maltreatment, neglect, parental mental illness, parental death, risk of/sexual abuse, risk of/physical abuse and other. One study just stated that maltreatment had occurred (Van Andel et al., 2016). For those studies that included adopted parents, five studies stated the age at which the child was adopted (Baker et al., 2015; Becker-Weidman, 2006; Juffer, 2005; Juffer et al., 1997; Opiola, 2016) and one study stated the age at which the child was removed from their birth parent(s) (Wassall, 2011).

Table 1. Characteristics of included studies.

Study	Country	Study Design	Children: age, gender, ethnicity and criteria for study	Parents: age, gender and ethnicity	Parents (N)	Intervention	Setting	Follow-up
Baker et al. 2015	USA	RCT	1.5 to 5 years, average=42 months. 47% adopted at birth, 47% experienced one placement, one child experienced three placements prior to adoption. Nearly all parents reported some utero maltreatment,	Adoptive parents; female-n=12, male, n=3; EA2: average age=37.88; Caucasian=6, Asian American=1, Multiracial=1 Delayed EA2:	8	*Emotional Attachment and Emotional Availability (EA2 Tele-Intervention).* A 6-week group intervention with 6-10 parents per session and 1 individual	Group; family home via Skype	Pre- and post-test

			one child was reported to have experienced post-birth physical maltreatment.	average age=40.14; Caucasian=5, Multiracial=2		session via Skype. Parents and their adopted children participated.		
			All children experienced developmental/intellectual, emotional, behavioural and/or attachment-related challenges.		7	Wait list then delayed intervention (EA2)		Pre-, post control and post-test
Becker-Weidman 2006	USA	Quasi	5 to 16 years, average=9.4 years. All children had to have a diagnosis of	Foster carers and adoptive parents.	Children n=34 Male to female ratio, 24:10	*Dyadic Developmental Psychotherapy* Weekly 2-hour sessions, one	Individual, outpatient therapy	Pre- and post-test

	Reactive Attachment Disorder (DSM-IV) All the foster children had been in their care for at least a year. Mean age of adoption=7 (treatment group), =5.4 (control group).	Caucasian=88 %, African American=6 %, Asian 6%	therapist, child and parent(s). Caregivers view the treatment from another room.
		Children n=30 Male to female ratio, 14:16 Caucasian=87 %, African American=3 %, Asian 10%	Usual care group

Benjamin 2010	USA	Quasi	Age range 6 to 15 years. BIPM: mean age=8.15; Caucasian=8 (40%), Hispanic/Latino=4 (20%), African American/Black=1 (5%), Native Hawaiian=1 (5%), Asian=1 (5%), two or more ethnicities=5 (25%). LLP: mean age=8 Caucasian=3 (15%), Hispanic/Latino=8 (40%), two or more	Foster carers in the process of adopting & Adoptive parents BIPM: mean age=49.85; female=16 (80%), male 4 (20%); Caucasian=16 (80%), Hispanic/Latino =1 (5%), African American/Black =1 (5%), two or more	20 20	*The Benjamin Interactive Parenting Model (BIPM)* 90-minute educational and interactive support programme, lasting 8 weeks. *Love and Logic Parenting Model (LLP)* Psychoeducational and behavioural modification programme,	Group	Pre- and post-test

	ethnicities=9 (45%).	ethnicities=2 (10%).		lasting 8 weeks.
	Wait list control (WLC): mean age=11.50; Caucasian=6 (30%), Hispanic/Latino=6 (30%), African American/Black=2 (10%), Asian=3 (15%), two or more ethnicities=3 (15%).	LLP: mean age=47.75; female=14 (70%), male 6 (30%); Caucasian=13 (65%), Hispanic/Latino =6 (30%), Asian=21 (5%).	20	WLC
	All children had to meet criteria for Buenning’s Modified Attachment Challenge Checklist	WLC: mean age=47.55; female=11 (55%), male 9 (45%); Caucasian=15		

				(75%), Hispanic/Latino =1 (5%), African American/Black =3 (15%), Asian=1 (5%).				
Bick & Dozier 2013	USA	RCT	1 to 22 months Mean=9.9 months Female=48% African American=59%, White, non-Hispanic=28%	Foster carers Mean age=45 All female. African American=43%, White, non-Hispanic=46%, Hispanic=7%, biracial=4%	44	*Attachment and Biobehavioural Catch-up (ABC)* 10 one-hour weekly visits at home. All sessions were video-recorded.	Individual, home visits	Pre- and post-test (30 days after completion) and at 12
					52	*Developmental*		and/or

						Education for Families intervention (control intervention) - 10 one-hour visits at home.		24 months of age.
Carnes-Holt & Bratton 2014	USA	RCT	2 to 10 years Mean age=5.5 years European American=47%, Latino=15%, Black American=9% and other=18% The parent had to report attachment related concerns and	Adoptive parents, overall 88.5%=European American CPRT: female =19, male=13 WLC: female=20, male=9	32	*Child-Parent Relationship Therapy (CPRT).* 10 sessions lasting 2-hours each. Plus weekly supervised play sessions.	Group plus play sessions	Pre- and post-test

			child behavioural problems to be included.		29	WLC		
Dozier et al. 2009	USA	RCT	3.6 to 39.4 months Mean age=18.9 months, 50:50 male, female ratio. African American=29 (63%), White non-Hispanic=12 (26%), Hispanic=2 (4%), Bi-racial=3 (7%).	Foster carers Female=42, Male=4	23	*ABC* 10 one-hour home visits. All sessions were video-recorded.	Individual, home visits	Pre- and post-test (30 days after completion).
					23	*Developmental Education for Families intervention (control intervention) -* 10 one-hour visits at home.		

Juffer et al. 2005	Netherl-ands	Quasi	Two subsamples: 1) Families with a 1st adopted child n=90 2) Families with birth children and 1st adopted child n=40 6-month-old infants; 7 years at follow up Sri Lankan=78, South Korean=39, Colombian=13. All adopted before the age of 6 months (mean=10 weeks)	Adoptive parents	50	*Attachment-based interventions carried out between 6 to 9 months.* Personal book providing information about sensitive parenting and playful interactions plus three sessions of home based video feedback.	Individual, visited at home – age 5, 6, 9 and 12 months. Lab visit at 12 and 18 months.	Pre- and post-test
					30	Personal book		

						on parental sensitivity.		
					50	Booklet on adoption issues (control group)		
Juffer et al. 1997	Netherlands	Quasi	6-month-old infants; 7 years at follow up Sri Lankan=71, Korean=19. 44 (48.8%)[a] boys and 46 (51.1%)[a] girls. All adopted before the age of 5 months (mean=8 weeks)	Adoptive parents Mean age=mothers 32.52 years and, fathers, 34.62 years.	30	*Attachment-based interventions carried out between 6 to 9 months.* Personal book providing information about sensitive parenting and playful	Individual, visited at home – age 5, 6, 9 and 12 months. Lab visit at 12 and 18 months.	Pre- and post-test

						interactions plus three sessions of home based video feedback.		
					30	Personal book on parental sensitivity.		
					30	Booklet on adoption issues (control group)		
Mersky et al. 2015	USA	RCT	2.5 to 7 years Average age=4.6 years Female=56% African American=61%,	Foster carers Mean age=44 Women=89% Caucasian non-Hispanic=49%,	43	*Brief Parent-Child Interaction Therapy (PCIT)* – two full day	Group workshops and telephone consultati	Pre-test, 8-weeks and 14-weeks

	Hispanic=18% Had to score in the clinical range on the Eyberg Child Behaviour Inventory (completed by the foster carer/parent)	African American=45%, Hispanic=5%		workshops and 8 weeks of phone consultation.	on.
			43	*Extended PCIT* – two full day workshops and 8 weeks of phone consultation plus a 7-hour booster session plus 4 more phone consultation sessions plus homework.	
			43	Waitlist control	

Minnis et al. 2001 and Minnis 1999	Scotland	RCT	8.3 to 14.9 years Mean age=11.25 years Female=43% 72% had a previous care placement, 26% previously in residential care, 72% previous foster care (52% of these >1, 8% >5 previous placements) Reasons: 69% abuse/neglect, 16% parental mental illness, 5% parental death Average of 7 years	Foster carers: Mean age of mothers=45, fathers=47, 94% had biological parents, 64% had their children living at home. Birth parents: 52% suffered from a mental illness of learning disability, 20% depression, 41% affective disorder, 17%	57	*Communicating with children: helping children in distress, a Save the Children manual. Foster carers' communication training (FCCT)* - standard service plus extra training which ran for 6 hours per day, the first two days ran consecutively	Group	Pre-, post-test and 9 months after

			with birth parent(s) and in their current foster placement for 2.5 years on average.	schizophrenia and 29% learning disability.		with a follow up day one week later.		
					64	Standard service (control group)		
Opiola 2016	USA	RCT	Range 2.5 to 9 years CPRT: mean age=5.7; female=16 (64%)[a], male=9 (36%)[a]; White=4, Black American=4, Hispanic/Latino=4, Asian=5, Biracial=6, African=2; Age at adoption: <1m	Adoptive parents CPRT: mean age=39; female=15, male=10; Caucasian=24, African American=1	25	*CPRT* Two-hour pre-treatment session plus 10, 2-hour, weekly groups. Including 4-6 parents.	Group	Pre- and post-test
				Control: mean age=39.92;	24	Control group - individual		

	(n=2), 1-6m (n=0), 7-11m (n=1), 12-23m (n=11), 2-4y (n=2), 5-6 y (n=4), 7+ y (n=5); Time with adoptive parents: <1 yr (n= 3), 12-23m (n=5), 2-4y (n=13), 5+ y (n=4). Control: mean age=5.23; female=8, male=16; White=13, Black American=1, Hispanic/Latino=2, Asian=6, Biracial=2; Age at adoption: < 1m (n=1), 1-6m (n=4), 7-11m (n=0), 12-23m (n=7), 2-4y (n=5), 5-6	female=15, male=9; Caucasian=18, Hispanic/Latino =3, Asian=3.		parent consultation once a week for 30 minutes, the majority opted for bi-weekly phone consultation.

			y (n=5), 7+ y (n=2). Time with adoptive parents: < 1 yr (n= 3), 12-23m (n=7), 2-4y (n=12), 5+ y (n=2) Parents self-referred due to attachment related concerns and difficulties regarding behaviour or stress in the parent-child relationship.					
Owen 2007	USA	Quasi	27 to 64 months Treatment: mean age 42.5 months; 2 (22.3%) female, 4 (66.7%) male;	Foster carers Treatment: mean age 42.5 months; 5	6	*A relationship-based group parent-training programme* Included a 6-	Group	Pre- and post-test

	Caucasian non-Hispanic=2 (33.3%), =5, African American=3 (50%), Asian=1 (16.7%). Control: mean age 46 months; 100% female; Caucasian non-Hispanic=3 (75%), Other=1 (35%).	(83.3%) female, 1 (16.7%) male; Caucasian non-Hispanic=2 (33.3%), =5, African American=3 (50%), Other=1 (16.7%). Control: mean age 46 months; 4 (100%) female; Caucasian non-Hispanic=3 (75%), Other=1 (35%).	4	week treatment programme. WLC

Sprang 2009	USA	Quasi	23.9 to 61.1 months All had experienced severe maltreatment. All diagnosed with attachment-related problems that put their placements at risk of breakdown.	Foster carers ABC: mean age=39.9; 5 male, 22 female; 22 white, 4 non-white	26	*ABC (relational intervention)* Biweekly support services plus ABC. This included 10 weeks of individual manualised sessions.	Individual	Pre- and post-test
				Control: mean age=35.5; 3 male, 23 female; 25 white, 2 non-white	27	Control group – usual care, bi-weekly support services.		
Triantafillou 2003	Canada	Quasi	Age range 12 to 18 years SFPG: average	Foster carers	9 (18 foster youth)	*Solution-Focused Parenting*	Group	Pre- and post-

	age=14.5; male=10 (55.6%); mean total number of previous placements=4.7 years; mean total length of current placement=3 years. Control: average age=15.7; male=4 (33.3%); mean total number of previous placements=5 years; mean total length of current placement=2.6 years.	7 (12 foster youth)	*Group (SFPG)-* 1.5 hours over 6 sessions. Control group – standard services.	test

Van Andel et al. 2016	Netherlands	RCT	4.3 to 33.3 months Mean age=18.8 months. Male=51% History: FFI: 93% experienced maltreatment, CAU: 89% experienced maltreatment.	Foster carers	65	*Foster Family Intervention (FFI)* - 6, 90-minutes home visits focusing on interactional and attachment themes in starting relationships.	Individual at home	Pre- and post-test
					58	Care as usual (CAU)– home visits every 2-6 weeks to monitor the placements.		

Vranjin 2012	USA	RCT	3 to 17 years, mean age=9 70% female Mean length of placement=13 months (range 5 days to 5 years) Sexually abused children	Foster carers Age range 26-62, mean age=44 Female=77% Caucasian=23, Biracial=3, Black=2, Latino=1, Native American=1	15	*Trauma Affects Kids Everywhere 5 Ways to Resilience* (*TAKE-5)* in person *or* telehealth sessions (5 weekly sessions). (Combined for the analysis). Aim: to enhance parenting skills for foster carers caring for children	Individual	Pre, post test and 5 weeks post test.

						who had been sexually abused.		
					15	WLC		
Wassall 2011	UK	Quasi	Age range 0-15.5 years, mean age=8.31 Female=18, male=18 White British=30 (83%)[a], British Asian=4 (11%)[a], Other=2 (5.5%)[a] Reasons: risk of neglect=14, neglect=12, physical abuse=6, risk of	Foster and adoptive parents Age range 33-59, mean age=47.77 Female=10, male=5 White British=22 (88%), British Asian=2 (8%), Other=1 (4%).	11	*Fostering Attachments (FA)* – a group based psychoeducational programme based on attachment theory. Includes 3 modules across 18 sessions	Group	Pre-, post-test and 8 months after

			physical abuse=3, sexual abuse=3, risk of sexual abuse=2, other=17 Removal from birth family = mean of 6.13 years ago Average number of placements=1.69 Length of current placement=5.01	Years of foster experience, average=5.46; years of adoptive experience, average=7.86 Average number of previous placements provided=18.17	11	lasting 1.5 hours each. WLC		
Wilson 2006	USA	Quasi		Foster carers LLP: age range 30-66, mean 43 years		*LLP* – aimed at initiating positive interactions,	Group	Pre-, post-test and follow

	Reading group: 41-51, mean 45.5 years WLC: 35-62, mean age 46 Overall age range 30-66, mean age=44.5		setting reasonable limits and modelling self-control through their interactions. Participants assigned to either:	up a few months later.
		11	1) 7-week Love-and-Logic parent training course	
		4	2) Read the Love-and-Logic	

	parent
	book
8	3) WLC

[a] = percentages calculated using available information

Type of intervention.

All acronyms for the interventions are detailed in Table 2. Three of the studies used the ABC programme (Bick & Dozier, 2013; Dozier et al., 2009; Sprang, 2009) and two used CPRT (Carnes-Holt & Bratton, 2014; Opiola, 2016). All of the other studies used a variety of different interventions. Of the 18 studies, half of the interventions were based on attachment theory. These included EA2 (Baker et al., 2015), DDP (Becker-Weidman, 2006), ABC (Bick & Dozier, 2013; Dozier et al., 2009; Sprang, 2009) FCCT (Minnis et al., 2001) and FA (Wassall, 2011) and two studies did not name their attachment based intervention (Juffer et al., 2005; Juffer et al., 1997). Two of the studies used CPRT, which is based on the filial therapy model (Carnes-Holt & Bratton, 2014; Opiola, 2016) and, one study based their intervention on the biopsychosocial model (BIPM) (Benjamin, 2010). Others used interventions that combined theories, such as PCIT, which is based on attachment and social learning theory (Mersky et al., 2015). The relationship based group and FFI join attachment, developmental and filial therapy models (Owen, 2007; Van Andel et al., 2016). One study based their solution-focused intervention (SFPG) on a systemic model (Triantafillou, 2003) and two of the studies used TAKE-5 and the Love and Logic parent training course, both behavioural based models (Vranjin, 2012; Wilson, 2006).

Eight of the studies were group interventions (Benjamin, 2010; Minnis et al., 2001; Opiola, 2016; Owen, 2007; Triantafillou, 2003; Wassall, 2011; Wilson, 2006), five were individual interventions (Becker-Weidman, 2006; Bick & Dozier, 2013; Dozier et al., 2009; Juffer et al., 2005; Juffer et al., 1997; Sprang, 2009; Van Andel et al., 2016; Vranjin, 2012), one involved a group plus a Skype session (Baker, et al., 2015), one involved a group plus play sessions (Carnes-Holt & Bratton, 2014) and one involved a group and follow up telephone sessions (Mersky et al., 2015).

In terms of the length of the interventions, 14 of the studies offered a weekly intervention (Baker et al., 2015; Becker-Weidman, 2006; Benjamin, 2010; Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Dozier et al., 2009; Opiola, 2016; Owen, 2007; Sprang, 2009; Triantafillou, 2003; Van Andel et al., 2016; Wassall, 2011; Wilson et al., 2006). Of these, one did not state the number of weeks over which the intervention took place (Becker-Weidman, 2006). The remaining studies ranged in length from 4 to 18 weekly sessions, with the most common being 10 weekly sessions (Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Dozier et al., 2009; Opiola, 2016; Sprang, 2009). Two of the studies used a combination of providing information and three interactive sessions at three monthly intervals (Juffer et al., 2005; Juffer et al., 1997). The other two studies ran two full day workshops and followed these up with either 8 weeks of phone consultation (Mersky et al., 2015) or a day long follow-up training one week later (Minnis et al., 2001).

Table 2. Intervention names and abbreviations.

Abbreviation	Intervention name
ABC	Attachment and Biobehavioural Catch-up
BIPM	Benjamin Interactive Parenting model
CPRT	Child-Parent Relationship Therapy
DDP	Dyadic Developmental Psychotherapy
EA2	Emotional Attachment and Emotional Availability
FA	Fostering Attachments
FCCT	Foster Carers' Communication Training
FFI	Foster Family Intervention
LLP	Love-and-Logic Parent Training Course
PCIT	Brief Parent-Child Interaction Therapy
SFPG	Solution-Focused Parenting Group
TAKE-5	Trauma Affects Kids Everywhere 5 Ways to Resilience

Measurement of parent-child interaction.

In terms of the outcome variables, all of the studies used a range of measures to assess the parent-child relationship. There were 16 different measures in total, summarised in Table 3. Self report measures were used in 10 studies to look at the parent-child relationship (Becker-Weidman, 2006; Benjamin, 2010; Mersky et al., 2015; Minnis et al., 2001; Owen, 2007; Sprang, 2009; Topitzes et al., 2015; Triantafillou, 2003; Wassall, 2011; Wilson, 2006). Four of the studies used only observational methods (Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Juffer et al., 2005; Juffer et al., 1997) and three studies used a combination of self report and observational methods (Baker et al., 2015; Opiola, 2016; Van Andel et al., 2016). One study used diaries that were coded by researchers (Dozier et al., 2009).

Eight studies used various measures of attachment, both self report and observational (Baker et al., 2015; Becker-Weidman, 2006; Benjamin, 2010; Dozier et al., 2009; Juffer et al., 2005, 1997; Minnis et al., 2001; Wassall, 2011) and one study used the Parent-Child Relationship Inventory (PCRI) (Wilson, 2006). Two studies used the Emotional Availability (EA) scale, which included a range of subscales, including maternal sensitivity (Baker et al., 2015; Van Andel et al., 2016). Other studies looked at maternal sensitivity as a standalone observed measure (Bick & Dozier, 2013; Juffer et al., 2005, 1997). Two studies used the Measurement of Empathy in Adult-Child Interaction (MEACI) (Carnes-Holt & Bratton, 2014; Opiola, 2016). One study looked at cohesion and adaptability within the relationship (Triantafillou, 2003); this was rated by both the parents and the children in the study. Eight of the studies used the Parent Stress Index (PSI), or variations of this including the short form, 4th addition, an alternative for adolescence and the Dutch version (Baker et al., 2015; Mersky et al., 2016; Opiola, 2016; Owen, 2007; Sprang, 2009; Van Andel et al., 2016; Vranjin, 2012; Wassall, 2011). Only one of these studies presented data for the parent-child dysfunctional interaction subscale of the PSI (Mersky et al., 2015).

Summary of results

The diversity in type of intervention and outcome measures prevented a meta-analysis from being conducted. Therefore a narrative review, where the various outcomes from each study are described and evaluated, was conducted. Of the 18 studies, 12 of them found at least one significant finding from the parent-child relationship outcome measures they used in favour of their intervention group (Baker et al., 2015; Becker-Weidman, 2006; Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Dozier et al., 2009; Juffer et al., 2005, 1997; Mersky et al., 2015; Opiola, 2016; Sprang, 2009; Van Andel et al., 2016; Wilson, 2006). Six of the studies, however, found no significant effects (Benjamin, 2010; Minnis et al., 2001; Owen, 2007; Triantafillou, 2003; Vranjin, 2012; Wassall, 2011).

Of those that found significant effects, where effect sizes were presented or it was possible to calculate these, eight studies reported large effect sizes on at least one of their outcome measures. These findings were evident in five of the attachment interventions (Baker et al., 2015; Becker-Weidman, 2006; Juffer et al., 2005; Juffer et al., 1997; Sprang, 2009) and in CPRT, filial therapy and behavioural models (Carnes-Holt & Bratton, 2014; Opiola, 2016; Wilson, 2006). These effects were found on observed measures of Emotional Availability (EA), Emotional Attachment and Emotional Availability Clinical Screener (EA2-CS), the self-report Randolph Attachment Disorder Questionnaire (RADQ), the communication and autonomy subscales of the Parent-Child Relationship Inventory (PCRI) and the Parenting Stress Index-short form (PSI-SF). On the Maternal Sensitive Responsiveness measure the initial study found a large effect of sensitivity but not cooperation (Juffer et al., 1997) and the latter study, with the same sample plus extra participants, found a large effect on cooperation and a medium effect on sensitivity (Juffer et al., 2005). Both studies using CPRT found large effect sizes on the observational measure, Measurement of Empathy in the Adult-Child Interaction (MEACI).

Six of the studies reported medium effect sizes. Three of these effects were evident in the attachment interventions (Bick & Dozier, 2013; Dozier et al., 2009; Juffer et al., 2005), one using CPRT (Opiola, 2016), one using attachment and social learning theory (Mersky et al., 2015) and one using FFI (Van Andel et al., 2016). These effects were discovered using the Strange Situation Procedure (SSP), they found a decrease in disorganised attachment rates following the PCIT intervention (Juffer et al., 2005). Medium effect sizes were evident on the avoidance measure of the Parent Attachment Diary and on the sensitivity subscale of the Maternal Sensitive Responsiveness observational measure (Juffer et al., 2005). Similar effects on sensitivity were found by Bick and Dozier (2013) during a 10 minute play interaction and also on the EA scales sensitivity, structuring, nonintrusiveness, responsitivity but not involvement (Van Andel et al., 2016). It is worth noting that Van Andel et al., 2016) found significant pre-test differences on the EA Scale, apart from the nonintrusiveness subscale. The medium effects on sensitivity, structuring and responsitivity should therefore be viewed with caution. Two studies using CPRT and PCIT found significant effects on the PSI-SF and PSI-4 respectively (Mersky et al., 2015; Opiola, 2016) and one study (Mersky et al., 2015) found that this medium effect size was apparent on the parent-child dysfunctional interaction sub-scale. On the ABC intervention there were significant effects on the avoidance measure, but not the security measure, of the Parent Attachment Diary (Dozier et al., 2009).

One study found a small effect on the support subscale of the PCRI (Wilson, 2006). Two studies did not present formal comparisons between the intervention and control groups; it is therefore not possible to summarise the effects of the FA intervention (Wassall, 2011) or Owen's (2007) relationship based parenting programme. In addition to the pre-test differences discussed above (Juffer et al., 2005), two of the studies found significant pre-test difference between the treatment and control groups (Owen, 2007; Triantafillou, 2003) but neither found significant effects on the measures they utilised to look at the parent-child relationship.

While two of the studies found significant effects on the PSI, these were not found in the EA2 intervention, FFI or TAKE-5 (Baker et al., 2015; Van Andel et al., 2016; Vranjin, 2012). The latter study stated that four children in the study exceeded the cut off age limit for the PSI and therefore the insignificant findings should be viewed with caution. Three of the other studies also stated that the measures used might have been inadequate in some way. The Reactive Attachment Disorder Scale (RAD) was thought to not capture the changes across the course of the FCCT intervention (Minnis et al., 2001) and the PCRI seemed inappropriate for the foster carers/parents, asking questions such as “I wonder if I did the right thing having children” (Wilson, 2006).

Table 3. Effects of the included studies at study end point.

Study	Total N	Intervention	Carer-child relationship outcome variables measures	Interve-ntion Mean (SD)	Control Mean (SD)	Effect size	Effect size category	Quality rating (no. of low-risk ratings)	Other threats to validity not assessed by the Risk of Bias tool
Baker et al. 2015	15	EA2	Emotional availability (EA), observational measure: sensitivity	5.7 (0.32)	4.2 (1.02)	1.98[a]	Large	1	Small sample size.
			EA: structuring	6.0 (0.58)	4.3 (0.82)	2.39[a]	Large		There were difficulties with participant availability and therefore the intervention group and delayed group
			EA: nonintrusiveness	6.6 (0.50)	4.0 (1.05)	3.16[a]	Large		
			EA: nonhostility	7.0 (0.00)	6.1 (0.92)	1.38[a]	Large		
			EA: responsiveness	5.4 (0.38)	4.1 (0.89)	1.90[a]	Large		

	EA: involvement	5.7 (0.61)	4.3 (0.78)	2.00[a]	Large	received the intervention concurrently, but separately.
	EA-Self Report (EA-SR): mutual attunement	37.0 (9.89)	25.3 (6.42)	1.40[a]	Large	
	EA-SR: child capacity to involve parent	42.5 (4.07)	35.4 (8.50)	1.07[a]	Large	
	EA-SR: affect quality	20.8 (2.70)	20.6 (3.78)	n.s.[b]		
	EA-SR: hostility	12.9 (6.31)	19.9 (5.80)	n.s.[b]		
	EA-SR: intrusiveness	20.5 (3.82)	21.4 (5.16)	n.s.[b]		
	Emotional Attachment & Emotional Availability Clinical Screener (EA2-CS), observational measure	82.6 (4.02)	62.9 (9.31)	2.75[a]	Large	
	Attachment Q-Sort (AQS), observational	0.16 (0.28)	-0.19 (0.22)	n.s.[b]		

			measure: security						
			Parenting Stress Index (PSI), self report	225.0 (26.62)	233.6 (30.85)	n.s.[b]			
Becker-Weidman 2006	64	DDP	The Randolph Attachment Disorder Questionnaire (RADQ), self report	20 (12.1)	69 (18.5)	1.58[a,g]	Large	2	Usual care-group and the treatment-group did not differ significantly on demographic variables or on baseline outcome variables.
Benjamin 2010[c]	60	BIPM	Revised Adult Attachment Scale (R-AAS), self report	3.00 (n/a)[d]	3.02 (n/a)[d]	n.s.[b]		2	Unequal demographic information at baseline. RCT turned into

									quasi-experimental design due to participant time constraints.
Bick & Dozier 2013	96	ABC	Maternal sensitivity - rated during a 10-minute play interaction, observational measure	n/a[d]	n/a[d]	0.53[a,g]	Medium	3	Observations constrained to 10-min play assessment, cannot be sure that findings extend to beyond the play interactions.
Carnes-Holt & Bratton	61	CPRT	Measure of Empathy in Adult-Child Interaction (MEACI), observational	27.36 (8.01)	43.37 (10.84)	0.46[e]	Large	2	Author was heavily involved in the

2014			measure						intervention and research, unsure if this introduced experimenter bias.
Dozier et al. 2009	46	ABC	Parent Attachment Diary: avoidance	n/a[d]	n/a[d]	0.68[a,c,g]	Medium	2	Small sample size.
			Parent Attachment Diary: security	n/a[d]	n/a[d]	n.s.[b]			Measures observed over a brief time frame.
Juffer et al. 2005[c]	130	Attachment-based intervention	Maternal Sensitive Responsiveness: sensitivity observational measure	5.64 (1.61)	4.84 (1.71)	0.48[a,c,g]	Medium	2	Not clear how group differences pre-test were
			Maternal Sensitive Responsiveness:	5.66 (2.02)	4.12 (1.67)	0.83[a,c,g]	Large		handled in the analysis.

			cooperation observational measure						
			Strange Situation Procedure (SSP), observational measure	2.28 (1.43)	3.41 (2.15)	0.62[a,c,g]	Medium		
Juffer et al. 1997[c]	90	Attachment-based intervention	Maternal Sensitive Responsiveness: sensitivity observational measure	5.8 (1.4)	5.2 (1.5)	0.84 [a,c,g]	Large	2	
			Maternal Sensitive Responsiveness: cooperation observational measure	5.9 (1.7)	4.5 (1.5)	n.s.[b]			
			SSP, observational measure of disorganised attachment	n/a[d]	n/s[d]	n.s.[b]			
Mersky	129	PCIT	Parenting Stress Index-	n/a[d]	n/a[d]	0.49[a]	Medium	3	Consent was

et al. 2015[f]	Short Form (PSI-SF), self report					taken after randomisation; therefore there may be unmeasured differences between participants and those that dropped out. Randomisation of the modest sample could mean that the groups were not matched on variables, such as age etc.
	PSI-SF: parental distress	n/a[d]	n/a[d]	n.s.[b]		
	PSI-SF: parent-child dysfunctional interaction subscale	n/a[d]	n/a[d]	0.60[a]	Medium	

									Power may be insufficient to detect smaller effects in pairwise contrasts.
Minnis et al. 2001	121	FCCT	Reactive Attachment Disorder Scale (RAD), self report	21 (9)	18 (9)	n.s.[b]		4	Outcome measures may not have been appropriate to capture changes across the course of the intervention.
Opiola 2016	49	CPRT	Parenting Stress Index, 4th edition (PSI-4), self	51.24 (4.94)	56.13 (7.94)	0.74[a,g]	Medium	5	Author was heavily involved

			report						in the
			Measurement of Empathy in Adult-Child Interaction (MEACI), observational measure.	27.83 (4.53)	43.79 (6.32)	2.90[a,g]	Large		intervention and research, unsure if this introduced experimenter bias.
Owen 2007	10	A relationship-based group parent-training programme	PSI-SF, self report	n/a[d]	n/a[d]	n/a[d]		2	Significant differences between treatment and control group pre-treatment. Small sample size such that the planned between groups analysis could not be

									conducted.
Sprang 2009	53	ABC	PSI-SF, self report	45.18 (26.76)	134.76 (24.08)	3.52[a,g]	Large	3	Small sample size.
Trianta-fillou 2003	16, 30 foster youth	SFPG	Family Adaptability and Cohesion Evaluation Scales II (FACES): Cohesion, foster youth rating, self report	3.4 (1.3)	4.9 (2.1)	n.s.[b]		1	Convenience sample. Group differences pre-intervention, those seeking services differ from those who do not.
			Family Adaptability and Cohesion Evaluation Scales II (FACES): Adaptability, foster youth rating, self report	4.6 (1.8)	4.9 (1.8)	n.s.[b]			
			Family Adaptability and Cohesion Evaluation Scales II (FACES): Cohesion, foster	4.0 (1.8)	5.4 (1.6)	n.s.[b]			

			carer/parent rating, self report						
			Family Adaptability and Cohesion Evaluation Scales II (FACES): Adaptability, foster carer/ parent rating, self report	5.4 (1.1)	5.6 (1.0)	n.s.[b]			
Van Andel et al. 2016[c]	123	FFI	Observational measures:					3	Smaller sample size than planned.
			EA: sensitivity	n/a[d]	n/a[d]	0.69[a,c,g]	Medium		
			EA: structuring	n/a[d]	n/a[d]	0.73[a,c,g]	Medium		
			EA: nonintrusiveness	n/a[d]	n/a[d]	0.60[a,c,g]	Medium		
			EA: responsitivity	n/a[d]	n/a[d]	0.46[a,c,g]	Medium		Significant pre-test differences on EAS (except nonintrusive-ness).
			EA: involvement	n/a[d]	n/a[d]	n.s.[b]			
			NOSI-R (Dutch version of the PSI), self report	n/a[d]	n/a[d]	n.s.[b]			

								Rating video observation is open to interpretational bias.
Vranjin 2012	30	TAKE-5	PSI-SF, self report	89.27 (7.32)	87.20 (9.86)	n.s.[b]	1	Four children included in the study exceeded the cut-off age limit for the PSI. Time intervals between the assessment time points differed between groups, this may have

								affected the internal validity of the study. Hierarchical linear modelling should have been used to allow for the variability among time intervals, rather than repeated-measures ANOVA.
Wassall 2011	25	FA	PSI, self report	n/a[d]	n/a[d]	n/a[d]	4	No tests of between-group differences.
			Stress Index for Parents of Adolescence (SIPA), self report	n/a[d]	n/a[d]	n/a[d]		
			Sense of Security	n/a[d]	n/a[d]	n/a[d]		Small sample

			Questionnaire, self report						size.
Wilson 2006	23	LLP	Self report measures:					2	Smaller sample size than planned.
			Parent-Child Relationship Inventory (PCRI): support	n/a[d]	n/a[d]	0.3[a,c,g]	Small		
			PCRI: satisfaction	n/a[d]	n/a[d]	n.s.[b]			PCRI did not seem completely appropriate for the participants (foster carers/parents), including items such as “I wonder if I did the right thing having children”
			PCRI: involvement	n/a[d]	n/a[d]	n.s.[b]			
			PCRI: communication	n/a[d]	n/a[d]	1.01 [a,c,g]	Large		
			PCRI: limits	n/a[d]	n/a[d]	n.s.[b]			
			PCRI: autonomy	n/a[d]	n/a[d]	0.96 [a,c,g]	Large		
			PCRI: role	n/a[d]	n/a[d]	n.s.[b]			

[a] Effect size = Cohen’s *d*: 0.2 = small, 0.5 = medium, 0.8 = large

[b] n.s. = non-significant findings

[c] Reported results for main intervention compared to control group

[d] = no data available

[e] Effect size for analysis of variance = partial eta-squared: 0.01 = small, 0.06 = medium, 0.14 = large

[f] = effects of group differences over time

[g] = effect size estimates

Methodological quality.

Using the Cochrane Handbook's Risk of Bias Tool version 5.1.0 (Higgins & Green, 2011) the methodological quality of the studies is presented in Figure 2 and summarised in Figure 3. In both figures, black indicates high risk of bias, white signifies low risk of bias and grey shows that the risk was unclear.

The first domain the tool assesses was the methods used to generate the allocation of participants to groups (Higgins & Green, 2011). In 13 of the studies there was apparent high risk of random sequence generation (Baker et al., 2015; Becker-Weidman, 2006; Benjamin, 2010; Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Dozier et al., 2009; Juffer et al., 2005, 1997; Owen, 2007; Triantafillou, 2003; Vranjin, 2012; Wassall, 2011; Wilson, 2006). The reasons included no randomisation, lack of information about how randomisation was completed or group allocation was based on participant's preferences. Five of the studies described their randomisation process adequately and this was interpreted as at low risk of bias (Mersky et al., 2015; Minnis et al., 2001; Opiola, 2016; Sprang, 2009; Van Andel et al., 2016).

The second domain looks at the methods used to conceal the group allocation. Allocation concealment was not sufficient in two of the studies (Benjamin, 2010; Owen, 2007) and the allocation of participants to groups could have been foreseen. Two of the studies described adequate concealment (Van Andel et al., 2016; Wassall, 2011). However, it was not possible to determine levels of allocation concealment from the remaining 14 studies.

Five of the studies failed to provide adequate explanation regarding the blinding of participants and personnel (Mersky et al., 2015; Minnis et al., 2001; Van Andel et al., 2016; Wassall, 2011; Wilson et al., 2006). Single blind studies were common with intervention studies, particularly when the control group is a waiting list control, rather than an active control group. One of the studies appeared to provide an explanation regarding the blinding of participants and personnel and both had active control groups which may have made this viable (Dozier et al., 2009).

Researchers assessing and coding the outcomes of the intervention were blind to group allocation in eight of the studies (Bick & Dozier, 2013; Carnes-Holt & Bratton, 2014; Dozier et al., 2009; Juffer et al., 1997; Mersky et al., 2015; Opiola, 2016; Sprang, 2009; Wassall, 2011) the remaining 10 studies did not discuss methods of blinding for this purpose, the risk was therefore unclear.

Four of the studies did not adequately state and describe how attrition was handled (Owen, 2007; Van Andel et al., 2016; Vranjin, 2012; Wilson, 2006); in all but one the numbers of non-completers was stated. In one it was hard to determine the number of participants and in all it was unclear as to how bias was managed in their analysis.

Six of the studies were deemed to be at low risk of incomplete outcome data. Either there was no drop out (Juffer et al., 2005) or the other five studies were transparent with their drop out rates, explaining how the missing data was managed in the analysis (Mersky et al., 2015; Minnis et al., 2001; Opiola, 2016; Sprang, 2009). One study stated the use of multiple imputation (Juffer et al., 1997). It was unclear how the remaining eight studies managed attrition.

Selective reporting, where not all the measured outcomes were provided in the results, was apparent in two of the studies (Carnes-Holt & Bratton, 2014; Dozier et al., 2009). The authors discussed the internalising and externalising subscales of the Child Behaviour Checklist-Parent version (CBCL) but only the total score and externalising problems subscale were reported in the results. The latter study only reported the main effect of their findings. There was no apparent selective reporting in 11 of the studies (Baker et al., 2015; Becker-Weidman, 2006; Benjamin, 2010; Bick & Dozier, 2013; Minnis et al., 2001; Opiola, 2016; Owen, 2007; Triantafillou, 2003; Vranjin, 2012; Wassall, 2011; Wilson et al., 2006).

Other sources of bias were evident in seven of the studies. These are summarised in Table 3. Generally these included problems with lack of power and small sample sizes, as well as significant pre test group differences (Baker et al., 2015; Dozier et al., 2009; Mersky et al., 2015; Triantafillou, 2003; Van Andel et al., 2016; Vranjin, 2012). In many of the studies the methods were inadequately described, resulting in 37% of the items on the Risk of Bias tool being rendered unclear.

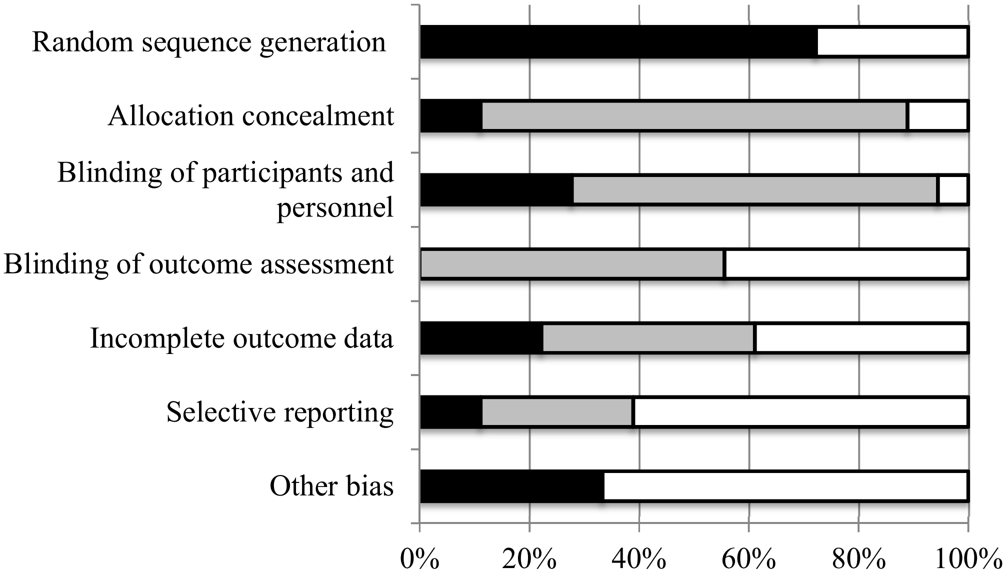

Figure 2. Risk of bias graph.

	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other bias
Baker 2015	H	U	U	U	U	L	H
Becker-Weidman 2006	H	U	U	U	U	L	L
Benjamin 2010	H	H	U	U	U	L	L
Bick 2013	H	U	U	L	U	L	L
Carnes-Holt 2014	H	U	U	L	U	H	L
Dozier 2009	H	U	L	L	U	H	H
Juffer 2005	H	U	U	U	L	U	L
Juffer 1997	H	U	U	L	L	U	H
Mersky 2015	L	U	H	L	L	U	H
Minnis 2001	L	U	H	U	L	L	L
Opiola 2016	L	U	U	L	L	L	L
Owen 2007	H	H	U	U	H	L	L
Sprang 2009	L	U	U	U	L	U	L
Triantafillou 2003	H	U	U	U	L	L	H
Van Andel 2016	L	L	H	L	H	U	H
Vranjin 2012	H	U	U	U	H	L	H
Wassall 2011	H	L	H	L	U	L	L
Wilson 2006	H	U	H	U	H	L	L

High risk	Low risk	Unclear risk
H	L	U

Figure 3. Risk of bias summary.

Discussion

This study aimed to systematically review the effectiveness of parenting and family interventions for foster carers and adoptive parents on the parent-child relationship. A total of 18 studies were included in the review. Based on previous reviews more empirical papers were identified than initially thought, which made the systematic collation of studies evaluating the outcome of the parent-child relationship a novel contribution to the research field. Overall, 12 of the studies found at least one significant effect of the intervention on the parent-child relationship and the majority of these were of a large or medium effect size. The studies suggest improvements in sensitivity, avoidance, empathy, attachment and parent-child dysfunction. However, the studies included in this review were generally poor in terms of their methodology, lack of transparent reporting and inclusion of a wide variety of outcome measures. It is therefore difficult to evaluate how effective these interventions were for improving the parent-child relationship and any tentative conclusions should be interpreted with caution.

Previous systematic reviews in the field of fostering and adoption have described similar limitations. While we know that children in care have much higher rates of attachment difficulties compared to those who have not been in care (Cicchetti et al., 2006) and there is an ever-growing emphasis on the benefits of building secure attachments for these children (Woolgar, 2013), it appears that little is known about what is helpful. This review has built on previous research, the majority of which had focused on how parenting interventions can reduce externalising behaviours (Kerr & Cossar, 2014; Solomon et al., 2017; Uretsky & Hoffman, 2017). Reviews focusing on the development of children's relationships have failed to include the grey literature, focused only on reviews in the UK or included solely adoptive parents (Drozd et al., 2017; Wassall, 2011). The current review addressed the limits of these previous reviews. The study comprehensively reviewed the effectiveness of interventions in different countries on the parent-child relationship across both peer reviewed and grey literature and included both foster carers and adoptive parents.

Whilst we were unable to draw definitive conclusions about what is helpful, it is possible to hypothesise on the reasons for the mixed efficacy in this area. A valid point raised by previous research was that relative to externalising behaviours, secure attachments take longer to build (Wassall, 2011). Considering the adverse early-life experiences, multiple separations, the effect on brain development, negative beliefs about themselves, interpersonal difficulties and emotional regulation difficulties (Ainsworth et al., 1978; Bowlby, 1988; Cassidy, 1994) it is understandable that some brief interventions fail to replicate significant improvements. For this reason efforts were made in this review to include outcome measures that were known to improve attachment, rather than just attachment based outcomes, for example maternal sensitivity. This decision was made with the use of a systematic review that collated all parent-child relationship outcomes (Pritchett et al., 2011). This review did find improvements in sensitivity, avoidance, empathy, attachment and parent-child dysfunction following some interventions. However, the reviews ranged in length with the most common being 10 weeks long. It is therefore possible that improving the parent-child relationship does not take place over a short-term parent or family intervention and that more time is needed.

It is also worth highlighting that many of the externalising and internalising behaviours are often an expression of attachment or relational difficulties. For example, a child might experience a feeling of rejection in response to suggestions that they go to bed and display anger that is difficult to manage. In this instance the externalising behaviours are inherently more visible than the underlying attachment difficulties. The focus of interventions could either be the management of this behaviour or understanding and responding to the underlying attachment difficulties. This notion fits with research stating that a secure attachment could be predicted by the knowledge the carer placed on the importance of the attachment (Dozier et al., 2001). Researchers have proposed that for this reason video feedback is one of the best methods of improving these relationships (Juffer, Bakermans-Kranenburg, & van Ijzendoorn, 2008) and in fact all of the studies included in this review that used an observational measure found at least one significant outcome.

While it is difficult to make comparisons given the heterogeneity of interventions and outcome measures, studies that included children under the age of five and a half had more significant effects on at least one of the parent-child relationship outcome variables compared to those that included children aged five to 18. Tentatively, this points in the same direction as previous research that found less avoidant attachment behaviours in younger children (Stovall-McClough & Dozier, 2004), although the authors made this distinction in children under 12 months of age. Other authors suggest that the critical time for structural neurological capacity for change is under the age of five years (Post, 2008; cited in Benjamin, 2010), which could account for better outcomes for children under the age of five.

Strengths and limitations of the studies.

Considering the disruption, placement changes and the number of services foster carers and adoptive parents are involved in, running interventions for these populations are inherently challenging. The nature of the RCT and quasi-experimental designs are therefore a relative strength of the studies included in this review. Additionally, many of the studies evaluate interventions that could be translated to a clinical setting, which is of upmost importance should they be found to be effective.

Despite this there are a number of limitations of the included studies. Firstly, sample sizes were relatively small and recruitment to these groups, particularly a waitlist control group, appeared to be challenging. Smaller sample sizes than planned led to low statistical power, which made it difficult to conclude if the interventions were effective. Additionally, while no limits were placed on the location of the studies, since the majority of the studies took place in the USA this affects the generalisability to UK practice. Furthermore, nearly all of the studies lacked an adequate amount of information to assess the risk of bias. Studies that adequately described their methods of randomisation, concealing group allocation and incomplete outcome data, were in the minority. While the majority of studies failed to blind the participants in these studies, it is important to note that this is difficult in intervention studies of this sort, especially if the comparison group is a waitlist control and in cases where the foster carers and adoptive parents may know each other already. This was clearly stated as a difficulty in one of the studies (Juffer et al., 1997).

Another limitation concerns itself with the outcome measures used in the reviewed studies. Firstly, the observational outcomes appeared to deliver more favourable findings in comparison with self-report measures. In one study the self report equivalent of the observational measures did not generate the same level of significance (Baker et al., 2015). Secondly, while the experimental raters were blind to condition, it is worth noting that this is a snapshot in time and that the parents may have also taken into consideration their emotional availability in other settings. Furthermore, the parents in this study may have underestimated their emotional availability for their child or found it difficult to reflect on this concept. Finally, it is also possible that the self-report measure is interpreted differently by each participant and is therefore open to bias.

Strengths and limitations of the review.

The method by which the relevant articles were screened was a particular strength of the review. Whilst time consuming, identifying the use of parent-child relationship outcome measures in the full article rather than the abstract ensured a comprehensive, transparent search strategy and the appropriate inclusion of studies. In addition, including both peer reviewed literature and grey literature reduced the effects of publication bias. Ensuring that some articles were cross-checked by a colleague at each stage of the data collection provided a level of reliability and adherence to the inclusion and exclusion criteria. Unfortunately, due to time and financial constraints it was not possible for a second reviewer to assess the eligibility all of the articles independently, although this would have been preferable.

This review utilised the Cochrane Handbook's Risk of Bias Tool (Higgins & Green, 2011) to assess the methodological quality of the studies. This is known to be a robust measure of risk of bias. However, it is worth highlighting that it is designed for RCTs and has been used in this review to assess the methodological quality of both RCTs and quasi-experimental designs. While this is not uncommon and used in previous reviews of this nature (Drozd et al., 2017) it results in the quasi-experimental designs all receiving high risk ratings for random allocation to groups. The measure also had a level of subjectivity and requires a degree of experience in research to determine the level of risk, especially when the methods of studies appear to be unclear.

Due to the heterogeneity of the types of interventions and the outcome measures used in this review it was difficult to compare across trials and meant that a meta-synthesis of the data was not viable. This made it difficult to make any firm conclusions regarding the efficacy of these interventions on the parent-child relationship. While it appears that some interventions appear to be effective for improving the foster parent-child relationship, the methodological flaws and mixed results make these conclusions tentative at best.

Research and practice implications.

This review built on previous systematic reviews and meta-analysis that discussed the importance of looking at the parent-child relationship (Solomon et al., 2017). However, additional systematic reviews would be of importance to allow firmer conclusions to be made about what is effective for children in care and their families. In order for this to be useful there should be consensus over appropriate, standardised outcome measures.

Future work could benefit from using a longitudinal approach to look at relational and attachment outcomes for children in care. It would be interesting to know if an intervention aimed at reducing internalising and externalising behaviours improves the parent-child relationship in the long-term. Furthermore it would be of importance to know what mediates this relationship. For instance it would be of interest to determine if a reduction in difficult behaviour in the home resulted in improvements in the parent-child relationship as a result of the parents understanding of attachment difficulties and the environment needed in order to develop a secure attachment to a caregiver.

Some of the outcome measures used in the included studies are female orientated, such as the Maternal Sensitive Responsiveness measure. This actively discriminates against male carers/parents and may account for the higher participation of women compared to men. Further research could focus on understanding these gender biases and selecting measures that are gender neutral or take into account the specific challenges faced by men and women.

Furthermore the carer/parenting interventions discussed in this review focus on observed or self-reported change and therefore the mechanism of change following the intervention is not known. Future research could focus on understanding the mechanisms of change as a result of the intervention which would evidence which parts of the intervention are helpful and why.

It has been recommended that available training should assist foster carers and adoptive parents to understanding attachment and how a secure attachment develops (NICE, 2010). Whilst the guidance states the need for training it lacks clarity on what type of intervention and how this should be delivered. This is in line with and reflects the lack of high-quality evidence we have for these interventions. Based on this review it would be important for policy-makers to fund high-quality research that looks at the development of parent-child relationships and long-term follow up on their attachment styles. These studies should be translatable to real life settings that are made easily accessible for all children in care and their carers or parents.

Summary.

Existing policy and theory points to the need to develop the parent-child relations for families with foster and adopted children. This review brings together all of the RCTs and quasi-experimental interventions that aim to look at this outcome. They indeed point to improvements in sensitivity, avoidance, empathy, attachment and parent-child dysfunction but the methodological weakness, small sample sizes and lack of high-quality studies makes it difficult to draw firm conclusions. Given the long-term effects of childhood maltreatment and multiple separations, researchers and policy-makers should identify appropriate and uniform outcomes and use these to focus on the short- and long-term benefits of effective interventions for this at risk group.

Empirical Study

Midlife Emotional, Physical and Substance Use Outcomes Following a Childhood in the Public Care System

Abstract

Interest in the link between childhood adversity and long-term psychosocial and physical outcomes in adulthood has gained ever-increasing amounts of attention. Evidence to date suggests that those who have spent time in public care have higher levels of psychological distress at age 33. The current study uses longitudinal data from the 1958 National Child Development Study to examine the long-term outcomes for adults at age 50 who spent time in public care in childhood.

Linear regression and binary logistic regression models were used to understand if care status predicted a range of adult emotion, physical and substance use outcomes. These included malaise, physical functioning, mental health, quality of life, self-efficacy, life satisfaction, relationship satisfaction, smoking status and alcohol use.

Being in care predicted higher levels of depression, poorer physical functioning and mental health, quality of life, life satisfaction and relationship satisfaction and greater likelihood of smoking at age 50 compared to those who had not spent time in care. These associations were evident even when controlling for a range of potential early-life confounding variables.

These findings are largely consistent with previous findings and suggest pervasive difficulties on later-life emotion, physical and smoking status for those who have spent time in public care

Introduction

There have been increasing amounts of attention paid to the link between childhood adversity and a range of long-term psychosocial difficulties. Research suggests that one in three adult mental health conditions are related to childhood adversity. These findings have been collated by the charity YoungMinds (Addressing Adversity, 2018) to increase the awareness of the importance of childhood experiences and the need for appropriate and timely intervention. Prevention and treatment approaches have therefore become high priority for campaigns, service commissioning and policy (e.g. Looked after Children, 2015 & Are you there? 2018).

While exposure to early maltreatment increases a child's risk of mental health difficulties (Gilbert et al., 2009), research has found that abuse and neglect does not affect all children in the same way and various factors such as genetics, physiology and brain development are at play (Woolgar, 2013). The brain, shaped continually by its environment, continues to develop until the mid-20s (Blakemore & Choudhury, 2006). Evidence to date suggests that there are structural and functional changes in the brain following early-life maltreatment. In children with histories of abuse, the corpus callosum appears to be smaller and the left hemisphere less active. Preliminary evidence also suggests changes in the frontal lobes, hippocampus and amygdala (Streeck-Fischer & van der Kolk, 2000; Teicher, 2000). The structures making up the limbic system (hippocampus and amygdala) appear to alter how children make sense of and process emotion, and this heightened state of arousal prevents the frontal cortex from both effectively evaluating situations and learning. It is important to note that these changes appear to be not only dependent on the nature of the abuse and the duration, but also the age of the child at the time the abuse occurred (Andersen et al., 2008).

Despite the early-life structural and functional adaptations made by the brain in response to childhood maltreatment, reversible changes are possible in a safe, nurturing and validating environment (Woolgar, 2013). However, this is dependent on the quality of the nurturing environment in which the child is placed. Repeatedly, studies have stressed the protective nature of developing a healthy attachment with a caregiver on later-life psychological difficulties (Hillman, 2014)

Attachment theory, proposed by Bowlby (1969), laid out the idea that forming a strong relationship with a stable caregiver allowed for successful development through childhood and into adulthood. Where a child is cared for by an individual who demonstrates sensitive, consistent and responsive parenting, that child feels safe to explore their surroundings. This enhances their learning but also provides a safety net, allowing the child to retreat to the caregiver when they are frightened or stressed (Ainsworth et al., 1978). The development of the so-called safe base characterises a secure attachment between a child and caregiver.

Depending on the child's attachment to their caregiver they would display a range of strategies to reduce distress. In the Strange Situation Procedure (SSP) a parent-child dyad are observed in a laboratory during which they are briefly separated and reunited (Ainsworth, et al., 1978). Initially the authors found that children would fall into one of three categories, securely attached where they would display signs of missing the parent when they were absent but actively engage with them on return, insecure ambivalent attachment where the child shows a high level of distress on separation and actively engages on return but with little resolution of distress or insecure avoidant attachment where the child display little distress at separation and active avoidance on return. However, a subset of children could not be easily placed into these three categories. The behaviour of these children was described as disorganised and could range from displaying a lack of any attachment strategy, behaviours that appeared to contradict themselves, stereotyped behaviours, freezing, confusion and apprehension (Main & Solomon, 1990).

Disorganised attachment styles are commonly observed in maltreated children who have a caregiver whose parenting style is absent, frightening and inconsistent (Main & Solomon, 1990). For the child the caregiver is threatening, rather than comforting and the child is unable to explore their surroundings. They seek to obtain control in order to create a sense of safety (Lyons-Ruth et al., 2005).

Children in care have been found to have rates of disorganised attachment as high as 90% (Cicchetti et al., 2006). This clearly poses a number of challenges for these young people in forming secure attachments with a new caregiver. Generally, it has been found that children under a year of age are able to form secure attachments relatively quickly, whereas older children demonstrate higher levels of insecure behaviours, such as withdrawal in response to distress (Stovall-McClough & Dozier, 2004). However, other research suggests that the age of the infant is less relevant and in fact the foster mother's state of mind is a significant factor when looking at attachment (Dozier et al., 2001). Children placed in foster care between birth and 20 months were able to form secure attachments with caregivers who demonstrated the value of attachment and reflected this with coherent discourse. In fact, these attachments were as secure as the attachments of children who were not in care (Dozier et al., 2001). This provides some support for the notion that attachment development is less time sensitive than previously thought.

The behaviours characteristic of disorganised attachment can mean, for instance, that a child does not find comfort from a caregiver reassuring in times of distress and may become increasingly anxious and angry. Without adequate training caregivers are likely to experience a lack of control, find this frustrating and feel irritable and impatient (Zeanah, Berlin, & Boris, 2011). These patterns of behaviour and a sense of not coping put the foster care placement at risk of breakdown (Ford et al., 2007; Rock et al., 2015). Evidence tells us that a stable long-term placement can guard against increasing externalising and internalising behaviour difficulties, that are common following placement breakdowns (Newton et al., 2000).

These challenges clearly highlight the corrective experience a stable and long-term foster caregiver could give a foster or adopted child. Interventions aimed at supporting and increasing the parenting skills of carers, decreasing placement disruptions and improving child outcomes have shown promise. The Department for Education (DfE) have offered a number of interventions including Multisystemic Therapy (MST), Treatment Foster Care Oregon (TFCO), Keeping foster and Kinship carers training and supported (KEEP) and Functional Family Therapy (FFT). Despite the possible corrective experience provided by foster and adoptive families, the emotional and behavioural difficulties often evident in care have been shown to persist into early adulthood (Cheung & Buchanan, 1997; Viner & Taylor, 2005).

It is plausible that the negative effects from early-life maltreatment might be sustained indefinitely. This possibility is in line with a growing body of work emphasising the stability of personality characteristics from mid adulthood (Roberts & DelVecchio, 2000), suggesting that since these difficulties are evident in early adulthood it might be expected that they would also be present in later-life. Additionally, it is conceivable these young people are not presented with the opportunity or are unable to foster new attachments to a primary caregiver (Bowlby, 1969). They never had the opportunity to attach to a consistent secure base and therefore they are unable to develop skills to self regulate their emotions or build reciprocal relationships. Their difficulties therefore persist and affect their development into adulthood.

However, a critique of the Bowlby-Ainsworth attachment theory is that children have been shown to form attachments to other figures, such as a sibling or peers (Field, 1996). This is contrary to the notion that these negative effects will persist. It is also worth considering attachments in later-life with spouses, partners and long-term friends, all of which might protect from psychosocial difficulties in later-life. Furthermore, initial work has shown that Mindfulness-Based training significantly reduces functional connectivity between the hippocampus and amygdala compared to a control group, repairing some of the effects of early-life maltreatment in adulthood (Teicher, Yan, & Lazar, 2017).

Attachment orientation has been found to be important for a range of later life outcomes. Insecure attachments have been found to be predictive of lower levels of well-being and research has shown that this is mediated by a number of factors including lower perceived social support and fatigue (Sirois, Millings, & Hirsch,

2016) and self-compassion (Homan, 2018). Well-being as a construct is often discussed as two overlapping yet distinct perspectives: hedonic and eudaimonic well-being (Ryan & Deci, 2001). The former addresses subjective well-being, that consisting of pleasure and/or happiness (Diener, 1994). The latter, eudaimonic well-being, reflects a fulfilling life of meaning and constructive goal orientated activity Waterman, 1993).

Previous literature exploring the relationship between attachment style and later life well-being has stressed the importance of attachment on marital satisfaction (Monin, Zhou, & Kershaw, 2014), maintaining social contacts and protecting against depressive symptoms in adulthood (Gillath, Johnson, Selcuk & Teel, 2011). Further research has noticed the importance on self-acceptance, personal grown, purpose in life, environmental mastery and interpersonal relationship quality (Homan, 2018). These studies highlight the importance of accounting for the breadth of impact of attachment on well-being in later life.

Longitudinal studies have had the opportunity to follow large cohorts of individuals who spent time in public care, providing a robust method of examining the lifetime trajectory of these young people. It is well documented that children in care have higher rates of mental health problems, behaviour and interpersonal difficulties, as well as lower educational attainment and increased contact with the criminal justice system (Ford, Vostanis, Meltzer, Goodman, & Ord, 2007; Minnis, Everett, Pelosi, Dunn, & Knapp, 2006). At age 15, children in foster care showed difficulties with social adjustment and were underachieving at school compared to those in stable adoptive environments (Bohman & Sigvardsson, 1980) and upon leaving care, this group have higher rates of emotional and behaviour problems

(Buehler, Orme, Post, & Patterson, 2000; Courtney, Dworsky, Cusick, Havlicek, & Perez, 2007; Lawrence, Carlson, & Egeland, 2006; Rutter, Quinton & Hill, 1990).

Studies in the UK using data from the NCDS1958 have shown that this picture of pervasive social disadvantage has been shown to continue past this transition phase from public care. Those who spent time in public care showed higher levels of psychological distress in their 30s compared to those who did not spend time in public care (Power, Stansfeld, Matthews, Manor, & Hope, 2002). At age 23 and 33, those who have spent time in public care as children had higher levels of malaise compared to those who did not spend time in care (Cheung & Buchanan, 1997). However, the gender differences are of interest. For women who have been in public care, their malaise scores reduced from age 23 and 33, whereas there is an observed negative trajectory for men (Cheung & Buchanan, 1997). Where women who have been in public care have higher rates of malaise at age 23, men exceed this at age 33 (Buchanan & Brinke, 1998; Buchanan, Brinke, & Flouri, 2000).

The findings from the NCDS1958 have been replicated for children born in the 1970s/1980s, collected through the British Cohort Study 1970 (BCS1970), providing further support for a link between public care and behavioural and emotional difficulties at age 30 (Dregan et al., 2011; Viner & Taylor, 2005). The authors found that individuals who spent time in care were more likely to be homeless, men were more likely to have sought help from a mental health profession than women and have poorer self-reported physical health (Viner & Taylor, 2005). The cohort who had been in public care fared less well on a number of other outcomes including depression, life dissatisfaction, self-efficacy, smoking status and number of criminal convictions. However they were no more likely that those who had not been in care to use illicit drugs or be dependent on alcohol (Dregan et al., 2011; Viner & Taylor, 2005).

The research suggests that drug and alcohol use was higher for adolescents in public care and for care leavers (Barth, 1990; English & Grasso, 2000; Mendes & Badal, 2006) but that this appears to decrease over time. Care leavers, ageing out of public care, provided reasons for reducing or stopping drinking alcohol. These included life circumstances such as having a baby to care for or personal health reasons (Ward, Henderson, & Pearson, 2003).

The majority of research has followed individuals up to age 33. Further evidence has found a link between childhood adversity and suicidal ideation at age 45 (Stansfeld et al., 2017). This research demonstrated that family illness, divorce, paternal absence and retrospective accounts of childhood physical and sexual abuse were associated with midlife suicidal ideation. However, this study did not separate those who had been in care and instead focussed on indicators of childhood adversity.

The literature in this field has a number of methodological weaknesses; the majority of studies relied solely on retrospective accounts of time spent in care recorded at age 23 (Buchanan, Brinke, & Flouri, 2000; Cheung & Buchanan, 1997; Power, Stansfeld, Matthews, Manor, & Hope, 2002). The retrospective self-report leaves the research open to inaccuracies and increases the amount of missing data if the cohort member did not respond at this time point. Collating reports of time spent in care at three points in childhood (age 7, 11 and 16) and retrospectively in adulthood (age 23) reduces potential inaccuracies (Dregan et al., 2011).

Another limitation, also discussed and addressed by Dregan et al. (2011), was that research using the NCDS1958 outcomes of childhood public care has been limited. Previous studies have failed to acknowledge the broader range of psychosocial outcomes and focus solely on psychological distress (Buchanan et al., 2000; Cheung & Buchanan, 1997). More recent research suggests that a focus on the broader range of psychosocial outcomes is essential in understanding the later-life impact for individuals who have spent time in public care (Dregan et al., 2011).

Dregan and colleagues (2011) discussed and addressed many of the methodological weaknesses stated above. Firstly, they used information to ascertain care status at four different time points and secondly, they opened up the idea of the impact of public care on a variety of areas and analysed a range of outcomes rather than a single domain. However, previous research looking at the long-term outcomes of individuals in care has failed to adequately describe the methods by which they manage missing data in their analyses. Managing high rates of attrition is an inherent challenge in longitudinal data; using multiple methods of managing missing data addresses the lack of transparency in previous research.

The existing research provides a platform to look further into the future and examine the psychosocial outcomes for individuals who spent time in public care. There is currently no information about how childhood public care might affect people in later-life. Looking at the outcomes for childhood public care at age 50 is of importance because it will demonstrate whether the psychosocial outcomes of these individuals continue to be poorer than their peers and, if so, what types of interventions would be warranted.

The present study therefore aims to address the following questions: Does childhood public care predict higher levels of self-reported malaise, smoking status, lower levels of quality of life, mental health and physical health functioning, poorer self-efficacy skills, lower relationship and life satisfaction at age 50? Do alcohol problems continue to be insignificantly different between those who spent time in public care and those who did not?

Method

Participants.

The data used in this study were drawn from the NCDS1958 (Brown, Elliott & Shepherd, 2012; Goodwin & Clark, 2011; Power & Elliott, 2006; http://discover.ukdataservice.ac.uk). The NCDS1958 is a longitudinal study following over 17,500 individuals who were born in England, Scotland and Wales during a single week in 1958.

Since the original birth survey, there have been a further nine sweeps to trace members of the birth cohort to follow physical, educational, economic and social development.

This study examined data collected when the cohort members were age 7, collected in 1965, age 11, collected in 1969, age 16, collected in 1974 and at age 23, collected in 1981. These four sweeps were collected by the National Children's Bureau. Further data was examined at age 50, collected in 2008 by the Centre for Longitudinal Studies (CLS), Institute of Education, University of London.

A total of 863 cohort members were identified at the first three sweeps (age 7, 11 and 16) and retrospectively at age 23 as young people who were in public care. This group also included cohort members whose parents indicated they were foster carers or adoptive parents but history of care was absent or inconsistent. This number represents 4.7% of the total number of cohort members who participated in the NCDS1958. The comparison group included all individuals who had not been placed in public care or adopted (n=16,274). Of those for which data was available regarding care placement of care the total sample consisted of 17,137 (51.5% male, 95.9% white ethnicity).

Independent investigators collected the data used in this study and therefore the current study had no control over the sampling strategy or sample size. A power analysis indicated that the available sample size provided appropriate power. For example, that study had >90% power to detect a modest (r=.05) zero-order association between care status and the dependent variables with alpha at .05 (two-tailed). This power analysis was performed with G*Power3.

Ethics.

Cohort members from the NCDS1958 provided informed consent for their data to be used at various data collection time points (Shepherd, 2012). Ethical approval was granted by Royal Holloway, University of London.

Measures.

Public care placements.

Information regarding placements in public care was based on questions that enquired whether or not the cohort member were ever in care in the past or at the time of the survey. This information was asked at four time points; age 7, 11, 16 and 23.

Other variables were used to add accuracy in identifying cases where an indication of being in public care was not provided. If both parental figures indicated that they were foster carers or adoptive parents at the time of the study, but no public care placement was reported, then the cohort member was included in the public care group.

Responses to each of the variables were coded as either one, indicating time spent in public care or zero, indicating no time spent in public care. A score of one on any of the variables was coded as one overall, indicating time spent in public care.

Early life covariates.

A number of factors were used to adjust for background differences between the public care and no public care groups. The variables included were known to be associated with childhood development (Anderson, Johnstone, & Remley, 1999; Jefferis, Power, & Hertzman, 2002) later life psychosocial difficulties (Grigoriadis & Robinson, 2007) and risk of public care (House of Commons, 2015). The selection of factors was guided by previous empirical data and constrained by the available study data.

Demographics.

These included gender (female or male), ethnicity (white or not white) and birth weight (88 ounces and above (normal/high birth weight) or less than 88 ounces (low birth weight)). These variables have been shown to be predictive of later-life developmental and psychosocial outcomes. Females have been found to have higher rates of depression compared to men (Grigoriadis & Robinson, 2007) and low birth weight has been shown to affect intellectual abilities in later-life (Jefferis et al., 2002),

Family characteristics.

Parental social class was determined by the father's occupation. If the father was not presented, social class was determined by the mother's occupation. Each cohort member's occupation was classified as: 1) unskilled, 2) semi-skilled, 3) skilled non-manual or manual, 4) managerial/technical or 5) professional. Socioeconomic status has been shown to be associated with a number of outcomes in later-life, inclusive of intellectual abilities (Jefferis et al., 2002).

The other two factors considered were whether the mother smoked during pregnancy and whether the child was breastfed. Mothers smoking during pregnancy has been shown to be associated with a range of physical (Cnattingius, 2004) and psychological difficulties. This includes higher rates of attention deficit/hyperactivity disorder in childhood (Melchior et al., 2015) as well as individual difference in psychological traits (Sutin, Flynn, & Terracciano, 2017). Breast feeding has been shown to protect from long-term chronic diseases (Binns, Lee, & Low, 2016) as well as being associated with increased cognitive ability (Anderson et al., 1999; Horta, Loret De Mola, & Victora, 2015). Both of these variables were categorical and coded as no or yes. All missing data was coded as minus one.

Adult outcome measures.

A wide range of outcome measures was selected to take account of the varied impact of care on later life. These included those of a psychological nature including The Malaise Inventory, self-efficacy, quality of life, life satisfaction, relationship satisfaction and the Mental Health subscale of the Health Related Quality of Life scale. The physical functioning subscale of the Health Related Quality of Life scale identified physical outcomes and smoking status and alcohol use addressed behavioural outcomes.

The Malaise Inventory.

The data for the outcome measures was drawn from the cohort member's responses at age 50. The Malaise Inventory is designed to measure emotional difficulties, well-being and stress and provides an indicator of depressive symptoms (Rutter, Tizard, & Whitmore, 1970). Items included "do you feel tired most of the time?" and "do you often feel miserable or depressed?" (Appendix 1). The self-report questionnaire has 24 'yes/no' items developed by the Institute of Psychiatry from the Cornell Medical Index.

The scale has been used in studies investigating the general population (McGee, Williams, & Silva, 1986; Rodgers, Pickles, Power, Collishaw, & Maughan, 1999) and clinical groups (Grant, Nolan & Ellis, 1990). The 24-item scale has been shown to have acceptable internal consistency, reliability and external validity. In addition, they argue that the shorter 15-item scale could be utilised in order to reduce completion time with little loss of reliability or validity (Rodgers et al., 1999). It has also documented that the Malaise Inventory differentiates well between individuals with a psychiatric disorder and those without (Rutter et al., 1970).

At age 50 cohort members in the NCDS1958 were asked to complete nine of the original 24 items. To the best of the authors' knowledge the reliability and validity data for this 9-item scale has not been reported. However, the CLS at the Institute of Education, London considered a score of four or higher to be a sign that the cohort member is experiencing symptoms associated with depression. A continuous score ranging from zero and nine for each cohort member was used for the present analysis.

Health Related Quality of Life.

The Short Form 36 Items Health Survey (SF-36) is a multi-purpose health survey that measures Health Related Quality of Life (HRQoL). It was developed at RAND as part of the Medical Outcome Study (Hays & Morales, 2001). The self-report measure includes questions about physical and mental components that generated a score on eight dimensions ranging from 0 to 100. Higher scores indicated better HRQoL. Example items included; "does your health limit you in… lifting or carrying groceries?" and "…as a result of any emotional problems have you… cut down the amount of time you spent on work or other activities?" (Appendix 1).

The eight health concepts form two distinct clusters. The scales identifying Physical Functioning (PF), Role-Physical and Physical Pain correlated most highly with the physical component and the majority of the scoring of these subscales made up the physical component summary (PCS). Conversely, the Mental Health (MH), Role-Emotional and Social Functioning subscales correlate most highly with the mental component and made up the majority of the Mental Component summary (MCS). The Vitality, General Health and Social Functioning subscales have important correlations with both the PCS and MCS (Ware, 2000).

Whilst there appears to be benefits to using the component summaries (Ware et al., 1995; Ware, Gandek, & Project, 1998) there is also conflicting evidence that the MCS/PCS scoring algorithm incorrectly summarises the subscale profile scores (Taft, Karlsson, & Sullivan, 2001). For the purpose of this research, the authors utilised the PF and MH scales. Respectively these have been shown to be relatively pure in terms of their validity and the best all-round measure of physical and mental health in the literature (McHorney, Ware, & Raczek, 1993). All eight scales of the SF-36 were found to have good item-internal consistency and item-discriminant validity. Both the MH and PF sub scales have been shown to have good reliability with a Cronbach's alpha exceeding 0.90 (Mchorney, Ware, Lu, & Sherbourne, 1994).

Quality of life.

The CASP-19 is a self-completion questionnaire designed to measure quality of life in the 'third age'. This is defined as freedom from family and work constraints, as opposed to the 'fourth age', encompassing decline and dependence (Wiggins, Higgs, Hyde, & Blane, 2004). At age 50 the cohort was asked to rate 14 of the full 19 Likert scaled items that cover four domains: control (C), autonomy (A), self-realisation (S) and pleasure (P). Each item is rated on a four-point Likert scale; higher scores indicate a better quality of life. Sample questions included "I feel left out of things" and "my age prevents me from doing the things I would like to" (Appendix 1).

When the 19-item scale was completed by people aged 65 to 75 years it demonstrated good internal consistency, internal reliability and validity with good concurrent validity assessed by positive correlation with an existing measure of life satisfaction (Life Satisfaction Index—well-being scale) (Hyde, Wiggins, Higgs, & Blane, 2003; James, Davies, & Ananthakopan, 1986). However, it is worth noting that this is based on individuals aged from 65 to 89 years of age, older than the cohort members who completed the NCDS1958 in 2008.

The NCDS1958 generates a summary score for both the CASP-12 and CASP-14. In line with guidance from the author, the CASP-12 summary score, ranging from zero to 36, will be used in this analysis (Brown et al., 2012; Wiggins et al., 2004).

Self-efficacy.

Self-efficacy of the cohort members was assessed at age 50 using three statements. These included: "whether they get what they want out of life", "whether they have free choice/control over their life" and "whether they feel they can run their life". Each statement was answered no or yes and coded as 1 or 2 respectively. A higher score indicated greater self-efficacy. The present analysis will use the continuous score ranging from one to six for each cohort member.

Life satisfaction.

Cohort members' life satisfaction at the time of the survey was based on a single item asking how satisfied they were with life. The item was rated from zero (completely dissatisfied) and 10 (completed satisfied). This continuous variable was used for the analysis.

Using online social media and inline with the INVOLVE guidelines (Hayes, Buckland, & Tarpey, 2012), members of the public were invited to comment and offer advice with regards to the design of the study. Following this input, members of the public rated subjective life satisfaction highly and therefore this was included as an outcome at age 50.

Relationship satisfaction.

Relationship satisfaction of the cohort members was based on a single question: "how happy is your relationship, all things considered?" This was scored from one (very unhappy) to seven (very happy). This continuous variable was used for the analysis. If this did not apply to the cohort members it was coded as not applicable.

Smoking status.

Smoking behaviour at age 50 was based on self-report of the individual's current smoking habits. The measure used grouped individuals into one of four categories: non-smokers, past smokers, occasional smokers and regular smokers. This measure was developed by the CLS at the Institute of Education.

For the purpose of the present study, cohort members were categorised as either smokers (those who self-reported being regular or occasional smokers) or non-smokers (those who reported being non-smokers or past smokers).

Alcohol use.

An alcohol problem at age 50 was ascertained using the Alcohol Use Disorders Identification Test (AUDIT). The AUDIT is a 10-item questionnaire to identify both harmful drinking (a score of eight and more) and alcohol dependency (a score of 13 or more in women and 15 or more in men). For example items asked cohort members: “how many drinks containing alcohol do you have on a typical day when you are drinking?” and “how often do you have six or more drinks on one occasion?” (Appendix 1).

Each item is scored from zero to four with a maximum score of 40 (Saunders, 1993; Saunders & Aasland, 1987). The measure has been found to have acceptable reliability and good validity (Saunders & Aasland, 1987). The NCDS dataset guide highlights that the wording of the AUDIT used in the data collection differed slightly from the official version of the AUDIT questionnaire. While the coding is roughly comparable the slight differences could have affected how questions were answered (Brown et al., 2012, p. 21).

For the purpose of the present study, each cohort member’s drinking habits were either classified as non-harmful (a score of less than 8) or harmful (a score of 8 and more).

Statistical Analysis.

Attrition is an inherent problem in longitudinal studies. The first step was to understand the percentage of missing data amongst the covariates and if the covariates predict the missingness of the data (Appendix 2 & 3). A binary logistic regression model was used to understand the classification of the missing data according to three categories: missing completely at random (MCAR), where the missingness of the data is independent of the responses, missing at random (MAR), where the missingness is independent of the missing data but related to the observed data and missing not at random (MNAR), where the missingness is dependent on the variable that is missing (Rubin, 1976).

There are differing views in the literature about how missing data should be managed. Commonly, missing data is deleted from all cases that are considered for analysis which can lead to selection bias and a loss of valuable information (King et al., 2001; Pampaka, Hutcheson, & Williams, 2016). Another option is to use multiple imputation (MI). This involves identifying predictors that are used to compute a number of new datasets where plausible values replace the missing values. These multiple new datasets are then merged to create a complete dataset (Rubin, 1996). While MI is criticised for adding simulated data, it in fact reduces bias by using the available data to create plausible values (Pampaka et al., 2016). Research supporting the use of MI has compared MI and a step-wise regression (ignoring the missing data) with an attrition rate of 61%. The findings support the use of MI, even for large numbers of imputed values.

In this study the data were initially analysed with complete cases, where all missing data was omitted. The missing data was then imputed using MI. 50 datasets were calculated, using all the variables as predictors as well as measures of childhood conduct, anxiety, hyperactivity and cognitive ability. These variables are known to predict adult health outcomes (Caspi, Roberts, & Shiner, 2005; Klein, Mannuzza, Hutchison, Lashua, & Castellanos, 2012; Moffitt, 1993 & Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007) and so their inclusion here affords better estimation for the multiple imputation. The two statistical outputs were presented alongside each other for comparison.

The dependent variables were correlated with each other to ascertain the level of overlap. The data was checked according to the assumptions for regressions models. All continuous variables were analysed in multiple linear regression models. A binary logistic regression model was used to analyse binary variables (smoking status and alcohol use). The analysis included all cohort members that completed the survey at age 50 in 2008. A *p* value of 0.05 was considered statistically significant. Analyses were carried out using SPSS version 21 (SPSS Inc., USA).

Results

Predicting missing data.

A binary logistic regression found that care status, gender, ethnicity and social class were predictive of missing data in all of the outcome measures at age 50: malaise, physical functioning, mental health, quality of life, self-efficacy, life satisfaction, relationship satisfaction, smoking status and alcohol use. Being breastfed was predictive of missing data on malaise, life satisfaction, relationship satisfaction, smoking status and alcohol use. Maternal smoking during pregnancy was predictive of relationship satisfaction missing data. Birth weight did not predict missing data for any of the outcome measures.

Correlations.

Spearman's correlations demonstrated that there were no significant associations between self-efficacy and malaise, self-efficacy and mental health and self-efficacy and physical functioning. However, all of the other dependent variables correlated with each other at the $p < .01$ level (Appendix 4).

To maintain consistency with previous literature, the dependent variables were analysed separately. It is important to note that each of the dependent variables reflect distinct difficulties and considerable controversy centres on the degree to which separation verses aggregation should occur. As such, the authors have remained agnostic and the results are presented openly.

Descriptive statistics.

Means and standard deviation for the ten outcome variables for both public care and no public care groups are shown in Table 4. With the exception of alcohol use, the public care group scores worse on the outcome measures compared to the no public care group.

Table 4. Descriptive statistics of complete cases (mean (standard deviation)) for adult outcomes age 50 for the public care verses no public care groups.

	Public care (n=107)	No public care (n=3688)
Malaise	1.81 (2.20)	1.33 (1.84)
Physical Functioning	83.87 (22.29)	87.85 (19.67)
Mental Health	72.45 (16.64)	76.96 (16.54)
Quality of Life	25.00 (5.53	26.69 (5.45)
Self-efficacy	4.00 (.55)	3.96 (.43)
Life satisfaction	7.10 (1.79)	7.57 (1.67)
Relationship satisfaction	5.43 (1.44)	5.67 (1.52)
Smoking status	1.39 (.49)	1.18 (.38)
Alcohol problems	1.13 (.34)	1.16 (.37)

Assumptions of regression analysis.

The assumptions for regression include linearity of residuals, independence of residuals, normal distribution of residuals, equal variance residuals and absence of outliers. The data met the assumptions of independence, linearity and absence of outliers. There was evidence that the data did not meet the normality of residuals or homoscedasticity assumptions. However, given the large data set there is evidence to suggest this does not adversely affect reliability (Stone, Scibilia, Pammer, Steele, & Kella, 2014).

Emotional outcomes.

A multiple linear regression analysis assessed the degree to which each of the variables (being in care, gender, ethnicity, birth weight, social class, smoking during pregnancy and being breastfed) predicted each of the continuous dependent variables at age 50. Standard beta coefficients are presented in Table 5 where complete cases have been analysed. In Table 6 standard beta coefficients are presented for multiple imputation data.

All variables combined accounted for a significant amount of variance in malaise scores at age 50 (Table 5). The partial regression coefficients showed that both being in care (t(3787) = 2.18, p =.03) and being female, (t(3787) = -10.43, p<.001) had a significant unique contribution to higher malaise scores at age 50, after controlling for the other variables. The analysis of the MI data supported these findings but also showed that higher social class (t(18549) = 2.49, p = .01) and smoking during pregnancy (t(18549) = 2.48, p = .01) had a significant unique contribution to higher malaise scores at age 50. Ethnicity, birth weight and being breastfed were not associated with malaise scores at age 50.

For mental health at age 50 all the variables combined accounted for a significant amount of variance (Table 5). The partial regression coefficients showed that being in care (t(3787) = -2.26, p =.02), being female, (t(3787) = 6.54, p<.001) and mother smoking during pregnancy (t(3787) = -2.18, p=.03) had a significant unique contribution on poorer mental health at age 50, after controlling for the other variables. The analysis of the MI data supported these findings but also showed that lower social class (t(18549) = -2.58, p=.01) and being breastfed (t(18549) = -3.09, p =

.003) had a significant unique contribution to mental health at age 50. Ethnicity and birth weight were not associated with mental health at age 50.

All variables combined also accounted for a significant amount of variance in quality of life at age 50 (Table 5). The partial regression coefficients showed that only being in care (t(3787) = -3.02, p = .003) had a significant unique contribution to quality of life at age 50, after controlling for the other variables. The analysis of the MI data supported these findings but also showed that lower social class (t(18549) = -3.57, p = .001) and smoking during pregnancy (t(18549) = -2.39, p = .02) had a significant unique contribution to lower quality of life at age 50. Ethnicity, birth weight and being breastfed were not associated with quality of life at age 50.

For life satisfaction at age 50 all the variables combined accounted for a significant amount of variance (Table 5). The partial regression coefficients showed that being in care (t(3787) = -2.68, p =.007) and mother smoking during pregnancy (t(3787) = -2.29, p = .02) had a significant unique contribution to lower life satisfaction at age 50, after controlling for the other variables. This finding was replicated use the MI data; the only difference was more highly significant *p* values using the MI data (t(18549) = -6.66, p = <.001) and (t(18549) = -3.16, p = .002) for being in care and smoking during pregnancy respectively. None of the other variables were associated with life satisfaction scores at age 50.

The variables combined did not account for significant variation in self-efficacy at age 50 (Table 5). However, the partial regression coefficients showed that being female had a significant unique contribution to lower life satisfaction at age 50 for both the complete cases and MI analysis respectively (t(3787) = -3.05, p = .002), (t(18549) = -4.21, p = <.001). Neither did the variables combined account for significant variation in relationship satisfaction at age 50 (Table 5). The analysis of complete cases showed that none of the variables had a unique contribution. However, the partial regression coefficients showed that for both the MI analysis care status (t(18549) = -2.03, p = .045) and smoking during pregnancy (t(18549) = -2.76, p = .01) had a significant unique contribution to lower relationship satisfaction at age 50.

Physical outcomes.

The predicting variables accounted for a significant amount of variance in physical functioning quality of life at age 50 (Table 5). The partial regression coefficients showed that being female (t(3787) = 6.01, p<.001), lower social class (t(3787) = -3.46, p=.001), mother smoking during pregnancy (t(3787) = -2.73, p=.006) and being breastfed (t(3787) = -3.03, p=.003) had a significant unique contribution to lower physical functioning quality of life scores at age 50. Analysis of the MI data supported these findings and demonstrated that care status (t(18549) = -4.08, p = <.001) and ethnicity (t(18549) = -2.45, p = .02) also had a significant unique contribution to lower physical functioning quality of life scores at age 50. Birth weight was the only variable that was not associated with physical functioning quality of life at age 50.

Table 5. Linear regressions (with standard beta coefficients) of the predictors on each dependent variable, with complete cases.

	Malaise	PF	MH	QoL	Self-efficacy	Life sat.	Rel. sat.
In care	.04*	-.02	-.04*	-.05**	.02	-.04**	-.03
Gender, male	-.17***	.10***	.12***	-.02	-.05**	-.02	.00
Ethnicity, not white	.02	-.01	-.01	-.02	-.02	-.01	-.01
Birth weight, <88oz	-.00	-.03	-.01	-.00	.00	-.02	-.01
Higher social class	.02	-.06**	-.02	-.03	.00	-.01	.02
Smoked-pregnancy	.01	-.05**	-.04*	-.01	-.00	-.04*	-.03
Breastfed	.01	-.05**	-.03	-.01	-.01	-.01	.01
F	16.86***	10.75***	8.71***	2.59*	1.71	2.54*	1.09
R^2	.03	.02	.02	.005	.003	.005	.002
Adj. R^2	.03	.02	.01	.003	.001	.003	.000

PF=Physical Functioning, MH=Mental Health, QoL=Quality of Life, Life sat.=Life satisfaction, Rel. sat.=Relationship satisfaction.

*p<0.05; **p<0.01; ***p<0.001.

Table 6. Linear regressions (with standard beta coefficients) of the predictors on each dependent variable, following Multiple Imputation (n=18557).

	Malaise	PF	MH	QoL	Self-efficacy	Life sat.	Rel. sat.
In care	.06***	-.05***	-.06***	-.06***	-.00	-.08***	-.03*
Gender, male	-.15***	.08***	.08***	-.03**	-.04***	-.01	.01
Ethnicity, not white	.03	-.04*	-.03	-.02	-.02	-.02	-.03
Birth weight, <88oz	.00	-.01	-.01	-.00	.01	-.01	-.01
Higher social class	.03*	-.05***	-.03*	-.05**	.02	-.01	.02
Smoked-pregnancy	.03*	-.05***	-.04**	-.03*	-.01	-.04**	-.03**
Breastfed	.02	-.05***	-.04**	-.02	-.01	-.02	-.01

PF=Physical Functioning, MH=Mental Health, QoL=Quality of Life, Life sat.=Life satisfaction, Rel. sat.=Relationship satisfaction.

*p<0.05; **p<0.01; ***p<0.001.

Substance use outcomes.

For those dependent variables coded categorically (smoking status and alcohol use at age 50), a binary logistic regression analysis was carried out. Odds ratios and 95% confidence intervals for the complete cases output are presented in Table 7 and for the multiple imputation data in Table 8.

A model based on all independent variables entered together was significantly accurate in predicting smoking status at age 50 (Table 7). The model correctly predicted the group membership of 81.8% of the cases. After controlling for the shared variance with the other variables, being in care (B = .99, SE = .21, p <.001), ethnicity (being not white) (B = .98, SE = .39, p = .01), being of a higher social class (B = .17, SE = .04, p <.001) and mother smoking during pregnancy (B = -.24, SE = .09, p =.008) showed significant predictive status with regards to smoking status at age 50. The MI data analysis was consistent in that it replicated significant predictive status of care status, social class and smoking during pregnancy. However, ethnicity (being not white) was no longer predictive of smoking status at age 50 (B = -.07, SE .18, p = .71) but not being breastfed became a significant predictor (B = .14, SE .05, p<.001). Gender and birth weight did not independently predict smoking status at age 50.

In addition, the model was significantly accurate in predicting alcohol use at age 50 (Table 8). The model correctly predicted the group membership of 83.7% of the cases. After controlling for the shared variance with the other variables, being male (B = 1.07, SE = .10, p <.001) and mother smoking during pregnancy (B = .24, SE = .10, p =.01) showed significant predictive status with regards to higher alcohol use at age

50. These findings were replicated with the analysis of the MI data. The other independent variables, including care status, did not independently predict alcohol use at age 50.

Table 7. Binary logistic regressions (with odds ratios (OR) and 95% confidence intervals (CI)) of the predictors on each dependent variable, with complete cases.

	Smoking status	Alcohol use
In care	2.68*** (1.79-4.01)	.80 (.45-1.44)
Gender, male	.98 (.83-1.16)	2.91*** (2.42-3.51)
Ethnicity, not white	2.67* (1.26-5.69)	1.52 (.66-3.48)
Birth weight, <88oz	1.26 (.92-1.73)	.85 (.58-1.25)
Higher social class	1.18*** (1.08-1.29)	1.06 (.96-1.16)
Smoked during pregnancy	1.27** (1.07-1.52)	1.27* (1.05-1.53)
Breastfed	1.16 (.97-1.39)	1.13 (.93-1.37)
χ^2	59.98***	151.20***
Cox & Snell R^2	.02	.04
Nagelkerke R^2	.03	.07

*$p<0.05$; **$p<0.01$; ***$p<0.001$.

Table 8. Binary logistic regressions (with odds ratios (OR) and 95% confidence intervals (CI)) of the predictors on each dependent variable, following Multiple Imputation (n=18557).

	Smoking status	Alcohol use
In care	2.65*** (2.16-3.24)	1.05 (.78-1.42)
Gender, male	.98 (.89-1.07)	2.59*** (2.32-2.90)
Ethnicity, not white	.94 (.66-1.34)	.78 (.52-1.18)
Birth weight, <88oz	1.08 (.90-1.31)	.94 (.75-1.17)
Higher social class	1.19*** (1.12-1.26)	1.03 (.97-1.10)
Smoked during pregnancy	1.27*** (1.14-1.41)	1.22** (1.09-1.37)
Breastfed	1.15** (1.04-1.28)	1.01 (.87-1.18)

**p*<0.05; ***p*<0.01; ****p*<0.001.

Discussion

The current study used data from the NCDS1958 to examine whether childhood public care was predictive of adult emotional, physical and substance use outcomes at the age of 50.

The results demonstrated that being in care predicted higher levels of malaise, higher likelihood of smoking, poorer physical functioning and mental health, poorer quality of life and lower life and relationship satisfaction at age 50, compared to those who had not spent time in care. These predictors remained significant after controlling for other covariates from early-life, including gender, ethnicity, birth weight, social class, mother smoking during pregnancy and being breastfed. Being in care was not predictive of harmful alcohol use or poor self-efficacy skills at age 50.

These findings are largely in line with previous work of this kind. The present results demonstrated support for higher levels of distress, as measured by the Malaise Inventory, for those who have spent time in care (Buchanan, Brinke, & Flouri, 2000; Cheung & Buchanan, 1997; Power, Stansfeld, Matthews, Manor, & Hope, 2002) and that these psychological difficulties continue to persist at age 50. Similarly, the predictive nature of care status on later-life depression, life satisfaction and smoking status replicates previous work, that used a different cohort at a later-life stage (Dregan et al., 2011).

The results show no significant difference in harmful alcohol use between those who had spent time in care and those who had not. This is in line with evidence at age 30 where individuals who had been in care did not score any worse than those who had not been in care (Dregan et al., 2011). Tentatively, this supports the notion that although young people in care have been found to have higher rates of alcohol use (Barth, 1990; English & Grasso, 2000; Mendes & Badal, 2006) this appears to reduce upon leaving care (Ward, Henderson & Pearson, 2003). Combined with outcomes at age 30, it appears that this reduction in alcohol use remains stable and continues into later-life (Dregan et al., 2011). It suggests that harmful alcohol use is not a pervasive difficulty for those who have spent time in care. Particularly in westernised societies, which is relevant for this study group, adolescence is a time when young people tend to initiate alcohol use (Brown & Tapert, 2006) and studies have suggested that younger age of first alcohol use is a predictor of harmful use in later-life (Grant & Dawson, 1997).

The literature, however, suggests it is not this simple. High novelty-seeking and low harm avoidance personality traits are thought to be characteristic of harmful alcohol use at age 27 (Cloninger, Sigvardsson, & Bohman, 1988). The persistence of alcohol use has been shown to be associated with personality traits associated with disinhibition, such as higher sensation seeking, impulsivity and lower constraint (Bennett et al., 1999; Chassin et al., 2002; Hill et al., 2000). It is possible that these personality traits that put individuals at risk of harmful alcohol use also underlie the familial risk factor but that a separate etiological pathway was also apparent (Chassin, Flora, & King, 2004). Evidence demonstrated that heavy alcohol and illicit drug use combined is indicative of heavier alcohol use in later-life (Chassin et al., 2004). However, information about illicit drug use was not compiled at sweep 8 of the NCDS1958. It is therefore not possible to differentiate those that are dependent on only alcohol and those that also use illicit drugs.

In contrast to Dregan et al. (2011) the results showed that care was not predictive of low self-efficacy skills at age 50. This is interesting in that it suggests a shift in either one or both groups from age 30 to age 50. By definition, self-efficacy is the belief in your capabilities to organise and execute an action of choice (Bandura, 1977). While self-efficacy has been shown to predict a number of health behaviours (Baldwin, 2006; Oei & Burrow, 2000), there is relatively little knowledge about how self-efficacy changes over time (Ashford et al., 2010).

Bandura (1977) proposed that through experience we receive feedback; should this be successful then a positive perception of self-efficacy is reinforced. Vicarious experience, verbal persuasion and improvements in well-being have also been proposed to enhance self-efficacy skills. We could hypothesise that for those in care self-efficacy skills take longer to develop. It is possible that over time there are more opportunities to attribute positive experiences to autonomous capabilities and therefore self-efficacy skills improve across the course of adult life. On the contrary, it is also possible that self-efficacy skills for those who did not spend time in care diminish before age 50. The NCDS1958 ask individuals to look back over what they have achieved at age 50 and it is possible that this brings with it mixed feelings of falling short or missed opportunities. Therefore the measure may not reflect self-efficacy as it is defined but rather a reflection at a point in time.

These findings confirm that spending time in care is a risk factor for later-life emotional, physical and smoking status outcomes at age 50. Aside from self-efficacy skills, the findings are consistent with the outcomes at age 30. It is important, however, that these findings are considered with caution and that the small yet significant associations should be taken into account. While care status is predictive of later-life difficulties, it is in fact not dissimilar to a range of other predictive factors, including gender, ethnicity, social class, mother smoking during pregnancy and being breastfed (shown in Tables 2 to 5). For instance, gender, specifically being female, was predictive of later-life depression and that social class and mother smoking during pregnancy are predictive, albeit to a smaller degree, of later-life depression. In fact gender was predictive of six of the nine outcome variables. In addition to depression, being female was predictive of lower physical functioning, mental health, quality of life, self efficacy skills and being male was predictive of a 2.9 increase in the odds of harmful alcohol use. The predictive nature of higher social class on malaise, physical functioning, mental health and quality of life is not necessarily what would be expected. It is important to highlight that the parents recorded their social class when the children were age seven. For children placed in public care before the age of seven the foster carers or adoptive parents are likely to have recorded their own social class, rather than the social class of their birth parents. This may have led to a higher social class status for these children resulting in higher social class predicting these later-life difficulties.

The literature around personality and later-life outcomes discusses the modest predictive nature of personality traits and the comparable importance of additional variables on later-life outcomes (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). The nature of this discussion is of importance for the current study and highlights that the small prediction of care status on later-life outcomes is likely to be as expected. It is possibly unsurprising that the range of later-life outcomes cannot be predicted from a single event and rather a combination of factors predict emotional, physical and smoking status at age 50.

These findings do not imply that being in care causes the outcomes at age 50. Given that we know the most common reason for being placed in public care include abuse and neglect (House of Commons, 2015) it is more likely that the public care measure in the current study is indicative of some degree of early-life adversity. There are, of course, a number of people who experience early-life adversity who are not admitted to public care; in fact nearly half of adults in England report some form of childhood adversity (Bellis, Hughes, Leckenby, Perkins & Lowey, 2014). When the adversity puts the child at high risk, admission into public care is deemed a preferable option. These children in public care are therefore likely to represent those who have experienced extreme abuse, neglect or had families who were unable to care for and protect them.

In line with evidence that found children in care had rates of disorganised attachment of up to 90% it is fathomable that attachment difficulties are present in this current sample who spent time in care (Cicchetti et al., 2006). Based on attachment theory, we can hypothesise that these individuals who spent time in care were not given the opportunity to develop secure attachments with a primary caregiver. This has led to negative beliefs about themselves and others and in turn impacted their ability to develop skills to self regulate their emotions and build reciprocal relationships. The results of this study support how this could have affected their development into adulthood (Ainsworth et al., 1978; Bowlby, 1969).

Furthermore, without a positive experience of a safe, nurturing and validating environment it is possible that the structural and functional changes in brain structure from early-life adversity remain and continue to cause challenges in processing and making sense of their own and others emotions. Aside from the changes in self-efficacy skills, the results demonstrate support for enduring difficulties and stability of traits from mid-adulthood to age 50 (Roberts & DelVecchio, 2000). Overall, these negative outcomes appear to be pervasive throughout childhood and into adulthood.

Implications.

The findings from this study have a number of implications for health and social care and policy. First and foremost, these findings suggest that more attention needs to be placed on the well-being of people who were in public care as children, not only at age 50, but from childhood through to adult life. It appears that these individuals continue to live with these difficulties and possibly did not access or did not find support helpful in their adult life. It is possible that the services these people can access offer practical therapies that focus on the difficulties in the present moment, such as Cognitive Behavioural Therapy (CBT), but therefore neglect the underlying attachment difficulties prevalent for individuals who have spent time in care (Cicchetti et al., 2006). Compared with CBT, attachment based therapies have a less robust evidence base, they are harder to quantify and therefore lack outcomes, they are also longer term and thus more expensive. All of these factors lead to less availability within the public sector for the people that might benefit from this model of therapy. It will be of importance for policy-makers to understand the underlying difficulties for these individuals to provide service that offer therapies appropriate for their needs.

An important question to ask is whether these negative outcomes are something that we should worry about. It has been made clear that being in care is one of many factors that predict later-life emotional, physical and smoking status outcomes. While it is not necessarily a causal effect, it is an easy marker that can be used by clinicians and professionals to add to our existing knowledge about the long-term effects of care. This will in turn ensure it plays a part in the wider formulation of someone’s difficulties.

A final implication is to think about what can be done in terms of prevention. Individuals from the NCDS1958 would have been in public care at some point between 1958 and 1976 and it is only in more recent years that preventing or reversing the effects of childhood adversity has been high on the agenda for policy-makers and those in public services (e.g. YoungMinds, 2018). Therefore, the quality of care may be better at present but we are unsure of the long-term outcomes for the individuals currently in care. It is important that we learn from longitudinal studies like the current study and work to reduce the rates of abuse and neglect in early-life and provide greater input to support foster carers and adoptive parents so they can provide a secure base for the children they care for.

Strengths.

The NCDS1958 is a remarkable resource, and a larger and more comprehensive longitudinal dataset of this kind would be hard to find anywhere in the world. The dataset allowed us to follow individuals who experienced public care in childhood up to age 50. Another strength of the study worth highlighting is the transparent management of missing data. Previous studies looking at the outcomes for children in care have fallen short of describing and discussing the inherent difficulties of attrition in longitudinal studies. Previous work has relied on the fact that there is reasonable representation between the original data and subsequent survey sweeps (Dregan et al., 2011; Plewis, Nathan, Calderwood, Hawkes., 2004). However, disadvantaged groups are more likely to be underrepresented and that data is not merely missing completely at random. Using multiple imputation allowed us to account for this missingness.

Limitations.

There are a number of limitations that are important to discuss. The outcomes from the 1958 cohort help us to understand predictors of later-life outcomes but they are not directly comparable to today’s population. For example the 1958 sample does not have the ethnical diversity of today’s population (Power & Elliott, 2006) and as previously mentioned, being in care in the 50s, 60s and 70s is likely to be different to the present day. It is possible to hypothesise that the outcomes for children today could be better than those in public care in the 1958 cohort.

A second limitation is that being in care did not tell us anything additional about their life prior and whilst in care. There are a number of factors that we know affect a young person in care. These include but are not limited to: the reason for the admission into care, the length of time spent in care, the number of care placements, the relationship the young person had with their carer and their overall experience. While reason for admission, length of time in care and number of care placements could have been recorded there would likely be a problem with the reliability of these responses. Asking individuals to retrospectively comment on their early-life experiences would have been impractical due to the large scale of the study but also likely unethical.

Thirdly, while the study can tell us being in care is a risk factor for later-life difficulties in certain areas it is not a causal relationship. As a result, this limits the conclusions that can be made from the study. However, the current study presents the outcomes within the constraints of the study design, since random allocation to public care would be unethical.

Finally, the measures used in this study are constrained by what was used at various time points in the NCDS1958. The information collected about social class is not a reliable indicator of the birth parents social class. Since the information was collected at age seven, those placed in public care prior to this are likely to have information for their foster carers or adoptive parents. The predictive nature of higher social class on later-life difficulties is likely to be confounded by the relative higher social class of foster carers and adoptive parents compared to those whose children are in public care.

It is important to highlight the limitations of a number of measures. This includes the 9-item Malaise Inventory taken from the 24-item scale, while the scale has been widely used in clinical and non-clinical samples (Grant, Nolan & Ellis, 1990; McGee, Williams, & Silva, 1986; Rodgers, Pickles, Power, Collishaw, & Maughan, 1999), the 9-item inventory has no current reliability and validity data. Good practice would suggest that the reliability and validity of this scale should be ascertained prior to its use in the NCDS1958. It is therefore worth bearing in mind that this 9-item scale may not measure depressive symptoms as intended and therefore lack validity. Self-efficacy, life satisfaction and relationship satisfaction were measured using independent questions rather than validated pre-existing scales and therefore need to be interpreted with caution. Interestingly, at age 50 the cohort members were asked to complete the CASP-19. This specifically looks at quality of life in the third age and has therefore been validated on a sample of people aged 65-75. Using this measure with people aged 50 may be appropriate, however there is currently no reliability and validity data for this age group.

Summary.

In summary, the findings from the current study suggest that being in care is a risk factor for emotional difficulties at age 50. Rather than these difficulties resolving in adulthood, they appear to be pervasive. Therefore, the concerns and subsequent provisions for the emotional well-being of individuals who spent time in care should be available throughout their life and these should be appropriate for their needs.

Future work could focus on understanding and recording why young people go into care. As we know there are various reasons and this might help tailor interventions depending on early-life experiences. If this were recorded on a large scale, similar to the NCDS1958 sample, it would allow researchers to use early-life experience as well as admission into public care as a predicting variable. Another next step for future research could be to focus on the long-term outcomes of attachment interventions. This could help further the understanding of these interventions and whether they mediate the long-term outcomes for individuals who have spent time in care.

Integration, Impact and Dissemination

Integration Summary

In adult mental health services, I have had the opportunity to work with a number of clients who spent a period of their childhoods in public care. Their stories were often characterised by frequent change and a lack of stability. While there are many individuals who experience this without ever being placed in care, it made me wonder what the future felt like for these individuals. As a psychologist, I considered whether the current input to support these families was working appropriately.

The thesis consists of: a) a systematic review of the existing literature on the subject, with the aim of understanding whether foster and adoptive parenting and family interventions improved the parent-child relationship and b) an empirical study section analyzing the longitudinal psychosocial outcomes at age 50 for individuals who been in childhood public care. Underpinned by attachment theory, our hope was that, given what we know about the high rates of attachment difficulties in looked-after children, interventions for foster carers and adoptive parents could facilitate a corrective experience. This could help to build a relationship with the young person in their care and ultimately a secure attachment. The aim would be that this would protect against the long-term, detrimental effects of early-life adversity.

In fact, we found that interventions for foster and adoptive families were mixed in terms of their efficacy. In some cases, they showed improvements in maternal sensitivity, empathy, attachment and reductions in avoidance. However, these findings should be approached with a high level of caution, due to the methodological weaknesses identified across all of the reviewed studies. Our systematic review would suggest that interventions are not leading to consistent improvements and therefore the long-term outcomes for looked after children may not be as positive as we might have hoped. The empirical study found higher rates of smoking and emotional and physical difficulties at age 50 for those who had been in public care, compared to those who had not.

While the two studies integrate theoretically in the manner described above, it is important to note that the longitudinal empirical study follows children who were in public care at some point between 1958 and 1976, whereas the intervention studies in the systematic review all published their data between 1997 and 2016. While fostering and adoption have always existed in the UK, the experiences of public care in these two time periods differ in a number of ways. By the late 1940s, additional legislation around adoption had been introduced, though there was still no streamlined process. The 1970s saw the start of adoption regulation as well as the Children's Act 1975 and Adoption Act 1976. The idea at this time was that children's services would be well-integrated with local authorities. However, in the 1950s to 1970s it was more common for children to be placed in orphanages, which is quite different from today. The current care system is set up to provide birth parents with some level of support, should it be deemed safe for them to keep their child at home. Child protection plans are used to set out guidelines for the family and the professionals to keep the child safe and should this fail the child is placed with family members (kinship care) or in foster placements (Luke, Sinclair, Woolgar, & Sebba, 2014).

There are a number of strengths associated with both studies. The empirical study benefited from a large sample size, despite the expected attrition rate at follow up. Furthermore, this was the first study to follow up children who had been in public care and look at their outcomes at age 50. Both studies aimed to incorporate transparent methodologies; these included the study selection process in the systematic review and the management of missing data in the empirical study.

The empirical study used a sample from the UK, increasing the relevance for policy-makers in this country. In contrast, in order to build on previous findings and to identify as much high-quality research as possible, no limits were placed on where the research was conducted for the systematic review. The majority of these studies were conducted in the USA, which, as commented on, may have impacted upon its generalisability.

The extent to which the questions of both studies have been answered is of importance. The systematic review brought together RCTs and quasi-experimental interventions with the aim of answering the research questions. The methodological weakness, small sample sizes and lack of high-quality studies resulted in inconclusive findings. This occurred despite reported improvements from more than half of the studies on maternal sensitivity, avoidance, empathy, attachment and parent-child dysfunction. The empirical study was able to answer the research questions it set out to and highlights the predictive nature of time in care on later-life emotional, physical and smoking outcomes at age 50. It is of note that assumptions when forming the research question could lead to more of a focus on the predictive nature of care. However, we also found that other factors, such as gender, predict these later-life difficulties and therefore the results should be viewed holistically. It is not possible to know what causes these later-life difficulties and we can only hypothesise with informed knowledge from theory and pervious research.

Methodological dilemmas.

There was a range of decisions made while designing the methodology of the empirical study. Firstly, the outcome measures used were constrained by available study data collected in 2008 at age 50. In order for the NCDS1958 to ensure continuity and consistency across time, the measures used when the study began have been routinely used at each data collection time point. Whilst this is important for researchers using the data as a means of comparing various outcomes across time, over time it results in some measures becoming decreasingly clinically relevant. The Malaise Inventory, for instance, has been widely used across research settings but is not a measure that would be used in clinical settings and therefore not a measure I was familiar with.

Additionally, with respect to the outcome measures, it would have been interesting to look at illicit drug use and criminal convictions at age 50. This would have allowed us to compare the BCS1970, who used some of the same outcome measures as we did as well as illicit drug use and number of criminal convictions. However, this data was not available from the NCSD1958 at age 50.

Another key decision was around the covariates included in this study. Our initial thoughts were to try to examine a range of factors in adulthood at both age 23 and 33, including educational attainment, family income, financial difficulties, occupation and availability of social support. The aim was to control for various factors after being in care. However, we later decided that it would be more helpful to only control for factors that represented the circumstances and experience for that individual prior to entry into public care. This allowed us to explore the predictive nature of care on later-life difficulties, independent from other factors that may have contributed to being placed in public care.

Reflections on data collection.

Prior to commencing clinical training, I was a Research Assistant managing the recruitment to a multi-site study. This role opened my eyes to the challenges of recruitment. Namely, matching groups based on demographic information, following inclusion and exclusion criteria and working to create a large enough data set with the requisite number of participants to draw firm conclusions. Through writing my systematic review, I have become further aware of the methodological flaws of inadequately powered experimental studies. By using an existing dataset I could gain access to a large enough data set for the analysis to be appropriately powered. Additionally, as a result of using the large NCDS1958 dataset, I have had to learn new data management skills. With guidance from my supervisor, I was able to increase my competence in building a final data set to work with, addressing missing data and using multiple imputation.

Service user involvement.

Another important aspect to reflect on is the input of service users. During the planning of the empirical study, I reflected upon who would be best placed to help me consider what would be useful to know about children who had been in public care. Various groups came to mind, including foster and adoptive carers/parents, children who had been in care and professionals who working in looked after children services. After a discussion on this topic, I was initially hopeful that the CLS, where all the NCDS1958 study information is held, would have a pathway in place for those who had participated to take part in planning and running research studies. With this in mind, my initial thoughts were to speak with a number of the NCDS1958 cohort to gather their thoughts on what would be a useful way of using the information they have completed over the last 50 years. However, despite multiple attempts at contacting the CLS, I did not receive a response and it appeared that this was not going to be a viable option. Despite this, I was able to gather information from a sample of 10 people using social media (who were not involved in the previous studies). These individuals were asked what information they thought would be useful to follow up from birth to age 50. Ideally, I would have preferred to use members of the cohort, but given the time constraints and deadline for the project, this seemed the best option available to me. The CLS, however, do have an online bibliography of all research using both the NCDS1958 and BCS1970. By submitting my research onto the website this will be available to all of the cohort members who participated in the study, as well as the general public.

Policy guidance.

Guidance around promoting the health and well-being of looked-after children highlight the importance of CAMHS for screening and identifying needs. However, the guidance is sparing with regards to what should be offered to that young person (DoE, Department of Health [DoH], 2015). NICE guidance suggests that young people should have access to attachment-based interventions and that attachment-focused training should be available for foster carers and adoptive parents (NICE, 2010). However, our systematic review tells us that if the aim is to strengthen the parent-child relationship, the evidence is inconclusive. Policy-makers should focus on the need for high quality research to ascertain what works for looked after children.

The empirical study shows that care, amongst other factors, is a risk factor for later-life difficulties. Tailored interventions should be evidenced to see if they are effective in addressing the higher rates of mental health difficulties, smoking and diminished quality of life. Long-term follow-up of foster and adoptive carer/parent and family interventions should be funded in order to see if the difficulties in later-life could be less pervasive than what we currently see.

Having effective interventions is one aspect, but in order for these two populations to benefit from the research, young people, their families and adults previous in public care need such support to be accessible. Child and Adolescent Mental Health Services (CAMHS) in the UK are known to be struggling to cope with the increasing demand (Dubicka & Bullock, 2017). If these interventions are to be effective, it is important that there are appropriately trained professionals with enough time to offer such support. Despite the persistent budgetary constraints across mental health services, early effective interventions might prevent the pervasive, possibly more global difficulties, we see in mid-adulthood, potentially reducing the overall costs to services.

In many ways, accessibility to mental health services for adults has improved since the launch of Improving Access to Psychological Therapy (IAPT) services in 2008 (NHS England, 2018). However, whether the commonly offered therapeutic model (CBT) is beneficial for this cohort is less well understood. Longer-term therapies in secondary care adult mental health services may serve some of this population but the majority of people are likely to fall short of the severity needed to meet the referral criteria. This difficulty of ‘slipping between the net’ is something that needs further attention from policy and funding for services.

Impact Summary

The possible impact on the following beneficiaries of this empirical study and systematic review covers two distinct points in life and three groups of people. These include children in public care, the adults that care for them as well as adults who have been in public care as children. This section will discuss who might benefit from the research, what aspect of the findings would be of interest or useful for them and how this information would be delivered.

Health care professionals.

Clinicians from social services and children's services will benefit from a report detailing the key findings of the systematic review. This report will highlight that current parenting interventions for foster carers and adoptive parents are not robust enough methodologically to make firm conclusions about their effectiveness on the parent-child relationship. The impact of our findings may help them think about what is being offered in the local area, the process of evaluating the intervention and thinking critically about what is most useful in clinical practice.

Midwives and perinatal mental health services would be additional beneficiaries, as they see many women and families who may be struggling for a variety of reasons in the perinatal and antenatal period. The empirical study indicated that those individuals who go in to public care are at higher risk than those who do not for later-life symptoms of depression, higher rates of smoking, lower self-reported mental health, physical functioning, relationship satisfaction and life satisfaction. For perinatal services, a talk and a summary of this information will add to their current knowledge of the importance of early-life experiences and help mothers manage the demands of parenthood in order to meet the needs of their child. Through contact with midwives and perinatal mental health services, biological parents may benefit from knowing why this phase of life is important. This might be most helpful through conversation, rather than formal information. However, in some circumstances it might be helpful to explain why services intervene at this time and, in turn, this might assist mothers to understand why accessing support is important and how it might be helpful for them and their child.

The research will benefit health care professionals working in adult mental health services. Talks at IAPT and adult mental health services would be designed to reach clinicians and possibly commissioners, to highlight the pervasive difficulties for adults who had been in public care. The talks would describe the study and focus on what we know so far about the long-term effects on mental health, but also quality of life, relationship satisfaction and rates of smoking. It will highlight the need for a full history prior to treatment, the need for tailored interventions for adults who were in public care in childhood and appropriate evaluation of interventions. This could lead to an increased number of evidence-based interventions offered by IAPT.

Parents and carers.

The early-life of children has been known for some time to be of importance and has been described as “unrememberable and unforgettable” (Watt, 2001). It seems that these experiences may not be as easy to overcome as we might like to believe and that going forward more emphasis needs to be placed on supporting, rather than criticising, parents (Gerhardt, 2015).

Foster carers and adoptive parents will benefit from a lay summary and training about two key aspects of the studies. A lay summary will be disseminated through foster and adoption agencies detailing the concerns about the long-term psychosocial difficulties for young people in care. The summary will be designed to invite questions and inform training about what foster carers and adoptive parents feel they require to best support themselves and the young person they care for. Further training that is effective for building the parent-child relationship is necessary for foster carers and adoptive parents. It might be that the impact of this research helps to raise awareness of the inconclusive nature of current parenting programmes on the parent-child relationship. Foster parents and adoptive carers may have a vested interest in research advances in this area. An observed large RCT in this area with a long-term follow up would demonstrate the impact of our systematic review findings. Having enough people in this study would be essential not only to generalise the findings, but due to the frequent placement changes that increase the levels of attrition in this population.

Support for parents and carers should help to change defensive behaviours that put children at risk of generational cycles that are characterised by an inability to regulate emotions and insecurity (Gerhardt, 2015). This up-skilling of parents might help to prevent some children requiring out of home care at the current unsustainable rate (Tickle, 2016). The observable effects might mean that less children go into care and those in care have more stable placements.

Young people in care.

Children previously in public care should benefit from what we know about higher rates of malaise and lower self-reported mental health at age 50. Through services being aware of the pervasive difficulties to age 50, there should be increased access to services that offer tailored treatments that take account of early-life difficulties and/or multiple separations. Other beneficiaries might include the family and friends of adults previously in care. With increased understanding for individuals who have been in care, they will be able to educate others and information will be informally passed on to increase a greater understanding of mental health.

Social media might be a useful way to reach looked after adolescents. A short press release and a link on Twitter and Facebook may help young people in care access mental health services earlier. It is plausible that this could help protect against some of the long-term outcomes we found in the empirical study. However, engaging young people to speak about their mental health and well-being is something that has previously been found to be challenging, with stigma cited as a major barrier (Prince's Trust, 2017). Our findings support the need outlined by the Prince's Trust Mental Health Strategy (2016) for children to have direct access to mental health services. Social media posts that are concise, informative and timely could direct young people to these services (The British Psychological Society [BPS], 2012).

Policy-makers.

While improving the outcomes for children in public care starts with raising awareness of the current long-term difficulties for these individuals, ultimately, changing policy will help to focus the direction of commissioning and clinical practice.

Policy-makers involved in making decisions about services availability for mothers with mental health difficulties, looked after children, foster and adoptive families will receive a report detailing the findings from the empirical study and systematic review. The aim will be to increase their knowledge of the long-term risks of being in care on mental health, physical health, quality of life and smoking at age 50. By increasing funding for interventions for adults earlier in life and increasing access to perinatal mental health services, there are likely to be preventative steps that could be taken.

A briefing paper for the House of Commons outlines the outcomes for children in care up to age 18. Our research demonstrates that the impact is much more pervasive than outlined by the House of Commons paper (2015). Providing longer-term follow up will help commissioners and policy-makers realise that these difficulties do not attenuate over time and more needs to be done to address the needs of this at risk group.

Furthermore, the prospective five-year mental health strategy states aims that lend themselves to our findings (NHS England, 2016). These include the need for innovative research and new models of care. The five-year strategy would be an effective place to impact future mental health care. With our findings in mind it could prioritise the need for high-quality evidence-based family and carer interventions and a model of care that works across disciplines to reach a wider group of adults that might benefit from interventions following a childhood in public care.

The researchers will provide a press release at the end of the study. This will aim to inform the beneficiaries regarding the finding of the study; namely, that care is a risk factor for later-life difficulties spanning mental health, physical health and smoking. It might also be a useful platform to raise concerns about the efficacy of foster and adoptive family interventions on the parent-child relationship. This might help build momentum for funding high-quality evidence-based research.

Dissemination Summary

Journal publications.

As part of our efforts to make the research widely available, we agreed that the empirical study would be suited to publication in the journal *Psychological Medicine*. The preceding paper by Dregan et al. (2011) published their research, looking at children who had been in care from the BCS1970 cohort and their outcomes at age 30, in this journal. It therefore seems logical that our follow-on study, following up a different cohort at age 50 could be published in this journal. *Psychological Medicine* is a high-impact international journal, which would ensure the study findings reached clinicians from varied disciplines. Other journals that we believe would reach specific groups of professionals include *Adoption and Fostering, Health and Social Care, BMC Public Health* and *Journal of Child Psychology and Psychiatry and Allied Disciplines.*

The systematic review would benefit a more specific group of clinicians and researchers. Therefore, we will consider publication in one of the following journals: *Children and Youth Services Review, Journal of Child and Family Studies, Child Abuse Review, Child maltreatment* or *Journal of Public child Welfare.* This would result in it reaching clinicians who are often responsible for the delivery of foster and adoptive parenting interventions.

Following publication we will submit the research to the CLS website. This will allow the research to be freely accessible for academics, clinicians, policy-makers, cohort members and the general public. Our aim will be to inform all beneficiaries about the research and add to the existing literature that has used the NCDS1958.

Conferences.

The following relevant conferences would also be a valuable method of disseminating the research:

- Adoption UK (AUK) Annual Conference;
- Looked After and Adopted Children (LAAC) Annual Conference;
- Royal College of Psychiatry;
- CoramBAAF Health Group conference: Similar but different - responding to the health needs of unique children, July 2018;
- XXII International Congress on Child Abuse and Neglect, September 2018;
- The Fostering Network: Skills To Foster - Training the Trainer, June 2018, September 2018 and November 2018.

Campaigns.

Public health campaigns that encourage people to stop smoking (Public Health England [PHE], 2015) are clear that smoking reinforces health inequalities and that smoking is more likely within disadvantaged groups. The empirical study demonstrated that those in public care are more likely to smoke at age 50 than those who have not spent time in childhood public care. Disseminating our findings to inform PHE might help to tailor campaigns to reach individuals who have been in care and think about passing on early information about cessation to this group.

Campaigns run by YoungMinds (2018) and the NPSCC (Are you there? 2018) are important for the dissemination of this project. Our findings around the long-term outcomes on mental health, physical health, quality of life, relationship satisfaction and smoking rates for those who were in childhood care speak directly to their work around addressing adversity (YoungMinds, 2018). By informing the NSPCC of the findings via a presentation and a brief report, it will be possible to increase the existing evidence base and join forces with this current campaign. Finally, the government has pledged funding for early interventions for young people with mental health difficulties off the back of an NSPCC campaign to increase the current support (NSPCC, 2018). Disseminating our findings to the NSPCC and working alongside them could help to increase the provision, to meet the needs of young people.

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Appendices

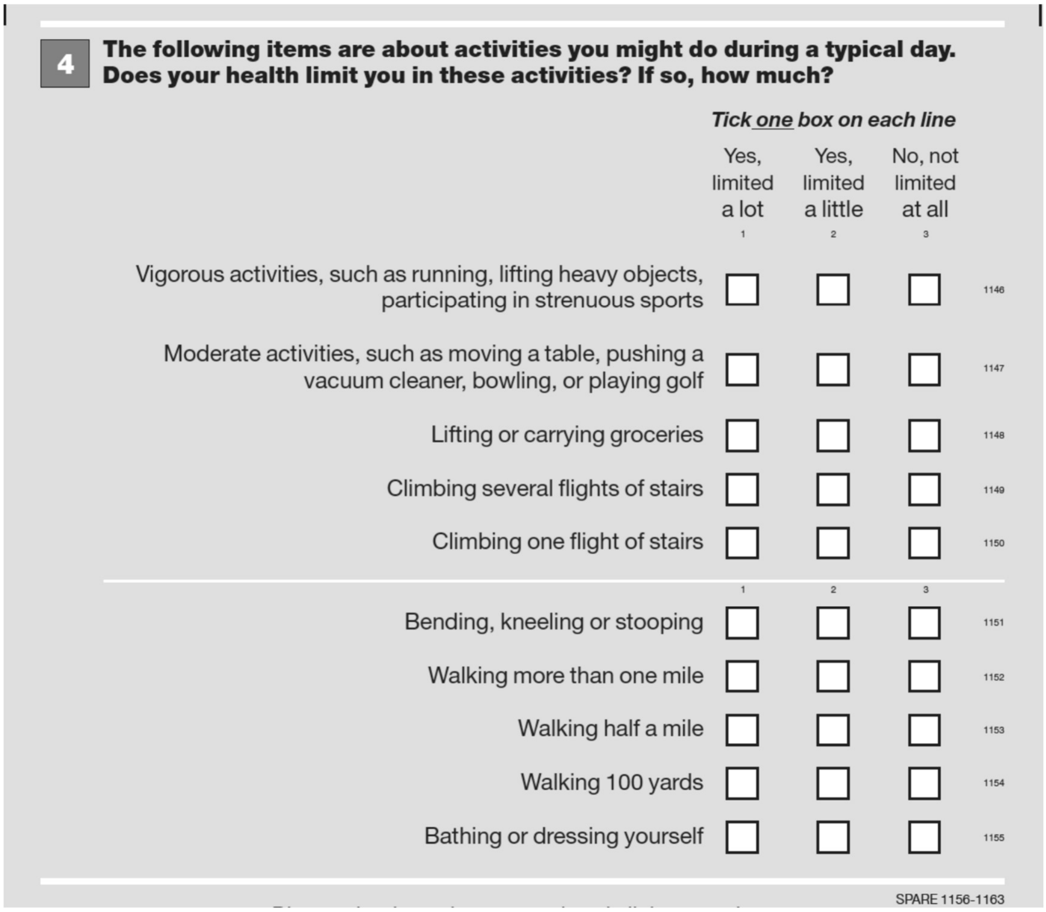
Appendix 1. Questionnaires used by the NCDS1958 in Sweep 8 (2008)

The Malaise Inventory.

MALINT
| The next questions are concerned with how you are feeling generally.
|
| TYPE IN 1 AND PRESS 'ENTER' TO CONTINUE
| 1 Continue
| [Don't Know and Refusal are not allowed]
|
| MAL02
| Do you feel tired most of the time?
|
| TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| 1 Yes
| 2 No
|
| MAL03
| Do you often feel miserable or depressed?
|
| TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| 1 Yes
| 2 No
|
| MAL05
| Do you often get worried about things?
|
| TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| 1 Yes
| 2 No
|
| MAL09
| Do you often get in a violent rage?
|
| TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| 1 Yes
| 2 No
|
| MAL12
| Do you often suddenly become scared for no good reason?
|
| TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| 1 Yes
| 2 No
|
|MAL14
| Are you easily upset or irritated?
|

| TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| 1 Yes
| 2 No
|
| MAL16
| Are you constantly keyed up and jittery?
|
| TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| 1 Yes
| 2 No
|
| MAL20
| Does every little thing get on your nerves and wear you out?
|
| TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| 1 Yes
| 2 No
|
| MAL21
| Does your heart often race like mad?
|
| TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| 1 Yes
| 2 No
|
| IF cohort

Health Related Quality of Life (SF-36).



4 **The following items are about activities you might do during a typical day. Does your health limit you in these activities? If so, how much?**

Tick one box on each line

	Yes, limited a lot 1	Yes, limited a little 2	No, not limited at all 3	
Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	☐	☐	☐	1146
Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐	☐	☐	1147
Lifting or carrying groceries	☐	☐	☐	1148
Climbing several flights of stairs	☐	☐	☐	1149
Climbing one flight of stairs	☐	☐	☐	1150
	1	2	3	
Bending, kneeling or stooping	☐	☐	☐	1151
Walking more than one mile	☐	☐	☐	1152
Walking half a mile	☐	☐	☐	1153
Walking 100 yards	☐	☐	☐	1154
Bathing or dressing yourself	☐	☐	☐	1155

SPARE 1156-1163

5 **<u>During the past 4 weeks</u>, have you had any of the following problems with your work or other regular daily activities as a result of your physical health? Have you...**

Tick <u>one</u> box on each line

	Yes 1	No 2	
Cut down the amount of time you spent on work or other activities?	☐	☐	1164
Accomplished less than you would like?	☐	☐	1165
Been limited in the kind of work or other activities you were able to do?	☐	☐	1166
Had difficulty performing work or other activities (for example, it took extra effort)?	☐	☐	1167

6 **<u>During the past 4 weeks</u>, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)? Have you...**

Tick <u>one</u> box on each line

	Yes 1	No 2	
Cut down the amount of time you spent on work or other activities?	☐	☐	1168
Accomplished less than you would like?	☐	☐	1169
Not done your work or other activities as carefully as usual?	☐	☐	1170

7 **<u>During the past 4 weeks</u>, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?**

Tick <u>one</u> box only

1171

Not at all ☐ 1
Slightly ☐ 2
Moderately ☐ 3
Quite a bit ☐ 4
Extremely ☐ 5

8 **How much bodily pain have you had <u>during the past 4 weeks</u>?**

Tick <u>one</u> box only

1172

None ☐ 1

Very mild ☐ 2

Mild ☐ 3

Moderate ☐ 4

Severe ☐ 5

Very severe ☐ 6

9 **<u>During the past 4 weeks</u>, how much did pain interfere with your normal work (including both work outside the home and housework)?**

Tick <u>one</u> box only

1173

Not at all ☐ 1

Slightly ☐ 2

Moderately ☐ 3

Quite a bit ☐ 4

Extremely ☐ 5

SPARE 1174-1181

10 **These questions are about how you feel and how things have been with you <u>during the past 4 weeks</u>. For each question, please give the one answer that comes closest to the way you have been feeling. How much time during the past four weeks...**

Tick one box on each line

	All of the time 1	Most of the time 2	A good bit of the time 3	Some of the time 4	A little of the time 5	None of the time 6	
Did you feel full of life?	☐	☐	☐	☐	☐	☐	1182
Have you been a very nervous person?	☐	☐	☐	☐	☐	☐	1183
Have you felt so down in the dumps nothing could cheer you up?	☐	☐	☐	☐	☐	☐	1184
Have you felt calm and cheerful?	☐	☐	☐	☐	☐	☐	1185
Did you have a lot of energy?	☐	☐	☐	☐	☐	☐	1186
	1	2	3	4	5	6	
Have you felt downhearted and low?	☐	☐	☐	☐	☐	☐	1187
Did you feel worn out?	☐	☐	☐	☐	☐	☐	1188
Have you been a happy person?	☐	☐	☐	☐	☐	☐	1189
Did you feel tired?	☐	☐	☐	☐	☐	☐	1190
Has your health limited your social activities (like visiting friends, relatives, etc.)?	☐	☐	☐	☐	☐	☐	1191

11 **For each of the following statements please choose one answer that best describes how true or false it is for you.**

Tick one box on each line

	Definitely true 1	Mostly true 2	Don't know 3	Mostly false 4	Definitely false 5	
I seem to get ill a little easier than other people	☐	☐	☐	☐	☐	1192
I am as healthy as anybody I know	☐	☐	☐	☐	☐	1193
I expect my health to get worse	☐	☐	☐	☐	☐	1194
My health is excellent	☐	☐	☐	☐	☐	1195

Quality of Life (CASP-19).

19 **Here is a list of statements that people have used to describe their lives or how they feel. We would like to know how often, if at all, you think this applies to you?**

Tick one box on each line

	Often	Some-times	Not often	Never	
	1	2	3	4	
My age prevents me from doing the things I would like to	☐	☐	☐	☐	1255
I feel what happens to me is out of my control	☐	☐	☐	☐	1256
I feel left out of things	☐	☐	☐	☐	1257
I can do the things I want to do	☐	☐	☐	☐	1258
	1	2	3	4	
Family responsibilities prevent me from doing what I want to do	☐	☐	☐	☐	1259
I feel that I can please myself what I do	☐	☐	☐	☐	1260
Shortage of money stops me from doing things I want to do	☐	☐	☐	☐	1261
I look forward to each day	☐	☐	☐	☐	1262
	1	2	3	4	
I feel that my life has meaning	☐	☐	☐	☐	1263
I enjoy the things that I do	☐	☐	☐	☐	1264
On balance, I look back on my life with a sense of happiness	☐	☐	☐	☐	1265
I feel full of energy these days	☐	☐	☐	☐	1266
	1	2	3	4	
I feel that life is full of opportunities	☐	☐	☐	☐	1267
I feel that the future looks good for me	☐	☐	☐	☐	1268

Please check you have completed all the questions

Alcohol Use (ADUIT).

| IF cohort member has drunk alcohol on most days, 2 to 3 days a week, once a week, 2 to
| 3 times a month, once a month, less often or only on special occasions
| [QSMKDRNK.DRINKS = 1 , 2 , 3 , 4 , | 5 , 6]
| |
| | AUDIT2
| | How many drinks containing alcohol do you have on a typical day when you are
| | drinking?
| |
| | TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| | 1 1 or 2
| | 2 3 or 4
| | 3 5 or 6
| | 4 7 to 9
| | 5 10 or more
| |
| | AUDIT3
| | How often do you have six or more drinks on one occasion?
| |
| | TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| | 1 Never
| | 2 Less than monthly
| | 3 Monthly
| | 4 Two to three times per week
| | 5 Four or more times a week
| |
| END OF FILTER
|
| IF cohort member drinks alcohol on most days, 2 to 3 days a week, once a week, 2 to 3
| times a month, once a month, less often or only on special occasions, or never nowadays
| [QSMKDRNK.DRINKS = 1 , 2 , 3 , 4 , 5 , 6 , 7]
| |
| | AUDIT4
| | How often during the last year have you found that you were not able to stop drinking
| | once you had started?
| |
| | TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| | 1 Never
| | 2 Less than monthly
| | 3 Monthly
| | 4 Two to three times per week
| | 5 Four or more times a week
| |
AUDIT5
| | How often during the last year have you failed to do what was normally expected from
| | you because of drinking?
| |
| | TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| | 1 Never
| | 2 Less than monthly
| | 3 Monthly
| | 4 Two to three times per week

```
| | 5 Four or more times a week
| |
| | AUDIT6
| | How often during the last year have you needed a first drink in the morning to get
| | yourself going after a heavy drinking session?
| |
| | TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| | 1 Never
| | 2 Less than monthly
| | 3 Monthly
| | 4 Two to three times per week
| | 5 Four or more times a week
| |
| | AUDIT7
| | How often during the last year have you had a feeling of guilt or remorse after drinking?
| |
| | TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| | 1 Never
| | 2 Less than monthly
| | 3 Monthly
| | 4 Two to three times per week
| | 5 Four or more times a week
| |
| | AUDIT8
| | How often during the last year have you been unable to remember what happened the
| | night before because you had been drinking?
| |
| | TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| | 1 Never
| | 2 Less than monthly
| | 3 Monthly
| | 4 Two to three times per week
| | 5 Four or more times a week
| |
| | AUDIT9
| | Have you or someone else been injured as a result of your drinking?
| |
| | TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| | 1 No
| | 2 Yes, but not in the last year
| | 3 Yes, during the last year
| |
AUDIT10
| | Has a relative or friend, or a doctor or other health worker been concerned about your
| | drinking or suggested you cut down?
| |
| | TYPE IN NUMBER AND PRESS 'ENTER' TO CONTINUE
| | 1 No
| | 2 Yes, but not in the last year
| | 3 Yes, during the last year
| |
| END OF FILTER
```

Appendix 2. Number of missing data for predictor variables

Table 9. Number (%) of valid cases for all predictors

	Gender	Birth-weight	Ethnicity	Social Class	Smoking	Breastfed
Valid	18554 (100)	17341 (93.4)	11418 (61.5)	14289 (77)	17415 (93.8)	14498 (78.1)
Missing	4 (0)	1217 (6.6)	7140 (38.5)	4269 (23)	1143 (6.2)	4060 (21.9)

Appendix 3. Predicting missing data

Table 10. Binary logistic regressions with odds ratios (OR) and 95% confidence intervals (CI) predicting missing data at age 50

	Malaise	PF	MH	QoL	Self-efficacy	Life sat.	Rel. sat.	Smoke	Alcohol
Care	1.59 *** (1.26-2.01)	1.59 *** (1.26-2.01)	1.59 *** (1.26-2.01)	1.58 *** (1.25-1.99)	1.58 *** (1.25-1.99)	1.58 *** (1.25-1.99)	1.61 *** (1.27-2.04)	1.52 *** (1.20-1.92)	1.56 *** (1.24-1.97)
Gender	1.32 *** (1.20-1.45)	1.36 *** (1.24-1.49)	1.36 *** (1.24-1.49)	1.35 *** (1.25-1.48)	1.32 *** (1.21-1.45)	1.32 *** (1.20-1.45)	1.21 *** (1.11-1.32)	1.31 *** (1.20-1.44)	1.31 *** (1.19-1.43)
Birth weight	1.14 (0.95-1.37)	1.09 (0.91-1.31)	1.07 (0.90-1.28)	1.10 (0.92-1.32)	1.14 (0.95-1.37)	1.14 (0.95-1.37)	1.08 (0.90-1.29)	1.09 (0.90-1.30)	1.13 (0.94-1.35)
Ethnicity	2.80 *** (1.95-4.01)	3.15 *** (2.16-4.61)	3.15 *** (2.16-4.61)	3.15 *** (2.15-4.61)	2.80 *** (1.95-4.02)	2.81 *** (1.96-4.02)	2.77 *** (1.89-4.05)	2.78 *** (1.94-3.98)	3.07 *** (2.13-4.42)
Social class	1.11 *** (1.06-1.17)	1.11 *** (1.06-1.17)	1.12 *** (1.06-1.17)	1.11 *** (1.06-1.16)	1.11 *** (1.06-1.17)	1.10 *** (1.06-1.17)	1.10 *** (1.05-1.15)	1.11 *** (1.05-1.16)	1.11 *** (1.06-1.17)
Smoking	1.09 (0.99-1.21)	1.08 (0.98-1.19)	1.09 (0.99-1.20)	1.09 (0.99-1.20)	1.09 (0.98-1.20)	1.09 (0.98-1.20)	1.13* (1.03-1.24)	1.08 (0.97-1.19)	1.08 (0.98-1.19)
Breastfed	1.15 ** (1.04-1.27)	1.09 (0.99-1.21)	1.20 (0.99-1.21)	1.08 (0.98-1.19)	1.14 (1.03-1.26)	1.14 ** (1.03-1.27)	1.19 ** (1.07-1.31)	1.13 * (1.02-1.25)	1.13 * (1.02-1.24)

PF=Physical Functioning, MH=Mental Health, QoL=Quality of Life,

Life sat. =Life satisfaction, Rel. sat. =Relationship satisfaction

*p<0.05; **p<0.01; ***p<0.001.

Appendix 4. Correlations between the dependent variables.

Table 11. Spearman's correlation (correlation coefficients) for the continuous dependent variables

	Malaise	PF	MH	QoL	Self-efficacy	Life sat.	Rel. sat.
Malaise	-	-.27***	-.63***	-.49***	-.01	-.36***	-.25***
PF	-.27***	-	.27***	.32***	-.02	.16***	.07***
MH	-.63***	.27***	-	.64***	.03	.47***	.33***
QoL	-.49***	.32***	.64***	-	.05**	.55***	.35**
Self-efficacy	-.01	-.02	.03	.05**	-	.07***	.04**
Life sat.	-.36***	.16***	.47***	.55***	.07***	-	.47***
Rel. sat.	-.25***	.07***	.33***	.35***	.04**	.47***	-

PF=Physical Functioning, MH=Mental Health, QoL=Quality of Life,

Life sat. =Life satisfaction, Rel. sat. =Relationship satisfaction

***p*<0.01; ****p*<0.001.