Identifying early indicators of Emotional and Behavioural Difficulties in Irish children and testing the feasibility of an online parenting intervention for improving child mental health

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Declaration

I declare that this thesis has not been submitted as an exercise for a degree at this or any other University and it is entirely my own work.

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Summary

Background: Emotional and behavioural difficulties (EBDs) are the most common reason for referral of children and adolescents to mental health services. It is important, therefore, to assess the overall prevalence of EBD in different contexts and in different age groups, whilst also identifying and addressing early risk factors in their development. Parental training programmes have been shown to be particularly effective in reducing EBD in children. The need for better access to evidence-based parenting interventions has been widely recognised and the internet may offer an alternative means of delivering evidence-based parenting programmes to larger numbers of parents. Triple P Online (TPOL) is an example of an online parenting programme. Previous research suggests that TPOL leads to positive outcomes for children, but few independent studies have examined this programme outside Australia where it was developed.

Study Aims and objectives:

The overarching aim of this research was to identify early risk factors of EBD in Irish children and to test the feasibility of implementing a parenting intervention to prevent or reduce EBD in this cohort. The specific objectives of the study were: (1) to investigate the extent of emotional and behavioural difficulties (EBD) in early childhood (5-year-old children) and their associated risk factors; (2) to explore the extent of EBD in young teenagers (13-year-old adolescents) and their associated risk factors; and (3) to assess the feasibility of implementing an online parenting programme to reduce EBD in children.

Method: This research involved three separate, but related studies designed to address the study objectives. Longitudinal data from the Growing Up in Ireland study were analysed to establish

the prevalence and predictors of EBD in (a) early childhood (5-year-old children) (N= 8,706) and (b) in adolescents (13-year-old children (N=7,488). A feasibility study was also undertaken to test the feasibility of implementing TPOL among the parents of Irish children who have EBD (N= 22).

Results: The overall prevalence of EBD among five-year-old children in Ireland, according to parental report, was 11.5% (n=997, 95% CI: 10.8%-12.1%), while the overall prevalence of EBD among 13-year-old children was 12.3% (N=922, 95% CI: 11.6%-13.1%). In terms of early childhood risk factors, EBD was best predicted by the child having EBD at the age of three, mothers reporting high levels of harshness/hostility in parenting style and mothers reporting high levels of stress. The most significant predictors of EBD in 13-year-old children were: having EBD at the age of nine, having a Specific Learning Difficulty (SLD) at nine-years-old and the mother reporting high levels of conflict with the child (also when aged nine). With regard to the TPOL, parents reported that they were satisfied with the quality of the programme and that they would return to TPOL if they needed help with parenting issues in the future. However, the results are limited by a very small sample size.

Conclusion: This research for the first time, identified the risk factors associated with EBD in childhood (early childhood and adolescents) taking into account, the perspective of both children and family (using longitudinal data). The findings provide a model by which children with multiple risk factors can be identified using longitudinal data. Additionally it was the first European study to demonstrate that it is feasible to implement TPOL in a family setting. This research, therefore, represents a useful addition to the national and international literature on online parenting programmes and suggests that it may be worth exploring further, their potential for improving children's outcomes.

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Abbreviations

ADHD	Attention Deficit Hyperactivity Disorder
AMF	Anonymised Microdata File
BFI	behavioural family intervention
CES-D	The Center for Epidemiologic Studies Depression Scale
CI	Confidence Interval
CSO	Central Statistics Office
CSQ	Client Satisfaction Questionnaire
DASS-21	Depression Anxiety Stress Scales-21
EBD	Emotional and Behavioural Difficulty
ECBI	Eyberg Child Behaviour Inventory
GP	General Practitioner
GUI	Growing Up in Ireland
ISSDA	Irish Social Science Data Archive
NEPS	National Educational Psychological Service
NICE	National Institute for Health and Care Excellence
ODD	Oppositional Defiant Disorder
OR	Odds Ratio
PCG	Primary Care Giver
PCIT	Parent-Child Interaction Therapy

PPC	Parent Problem Checklist
PS	Parenting Scale
PSOC	Parenting Sense of Competence Scale
RCT	Randomised Control Trial
RMF	Research Microdata File
RQI	Relationship Quality Index
SCG	Secondary Care Giver
SD	Standard Deviation
SDQ	Strengths and Difficulties Questionnaire
SLD	Specific Learning Difficulty
SMD	Standardised mean differences
TPOL	Triple P Online
UK	United Kingdom
US	United States
WHO	The World Health Organisation

Chapter 1 Introduction to Thesis

1.1 Background

Positive mental health may be defined as 'a state of emotional and social well-being in which the individual realises his or her own abilities, can manage the normal stresses of life, can work effectively and is able to play a role in his or her community' (1). The World Health Organisation (WHO) suggests that by 2030, mental illness will be the leading cause of disability in high-income countries (2). Furthermore, the Marmot Review states that the foundations for virtually every aspect of human development (physical, intellectual, emotional) are laid down in early childhood. Thus, the early years have a lifelong effect on many aspects of health and well-being, from obesity, heart disease and mental health to educational achievement and economic status (3).

In childhood, mental health problems primarily involve social, emotional and behavioural difficulties (4). The National Institute for Health and Clinical Excellence (NICE) defines social and emotional well-being across three dimensions including emotional well-being (e.g., happiness), psychological well-being (e.g., resilience) and social well-being (e.g., having good relationships with others) (5). The most commonly used term to describe problems which can impinge on a child's psychological or mental well-being is "emotional and behavioural difficulty" (EBD). In Ireland, the National Educational Psychological Service (NEPS) defines EBD as the difficulties experienced by children that can act as a barrier to their personal, social, cognitive and

emotional development (6). In the US, EBD is described more specifically as a condition in which a child's behavioural or emotional responses are so different from those of the generally accepted age-appropriate norms of children with the same ethnic or cultural background, as to result in significant impairment in social relationships, self-care, educational progress, and/or classroom behaviour (7, 8).

EBD is typically divided into externalising and internalising behaviours. The former typically include hyperactivity, non-compliance and aggression, all of which are outwardly manifest behaviours which, if left untreated, may deteriorate into a full-blown psychiatric disorder such as Oppositional Defiant Disorder or Conduct Disorder (ODD)(4). Internalising EBDs may include anxiety, withdrawal and depression, all of which reflect internal/inner emotional distress that may not be immediately obvious to others (4).

1.2 Prevalence of EBD

EBD appears to have increased markedly in prevalence among children and adolescents living in developed countries over the past 50 years (9). In the UK, Collishaw *et al*. examined the prevalence of emotional problems in adolescents between 1986 and 2007 and found that twice as many adolescents reported frequent feelings of depression or anxiety in 2006 than in 1986 (10). Between 10-20% of school children experience EBD such as behaviour problems, anxiety and depression, during the course of any given year and may require the support of mental health services (11-13). This figure has been found to be as high as 25% amongst children from

socially disadvantaged backgrounds in Ireland (14). In Scotland, 11% of five-year-olds have been reported as having 'borderline' or 'abnormal' EBD (15), compared to 13% and 15% of seven-year-old children in Northern Ireland and England respectively (16). A recent Irish epidemiological study which surveyed 1,131 children aged 11-13 years, found higher current rates of mental disorder (15.4%) in Irish children than children of a comparable age in both the US (11.2%) and the UK (9.6%) (17). Earlier studies in Ireland reported similar findings. For example, the Clonmel study screened 3,374 children and adolscents in 2006 to determine the prevalence of mental health problems in the South East of Ireland (18). They estimated that nearly 15% of under 5 year olds, 19% of 6-11 year olds and 21% of 12-18 year olds, met the criteria for at least one psychological disorder.

Epidemiological data on the early development of mental disorders are particularly important in terms of effectively targeting preventive interventions in childhood (19, 20). However, there are very few published population-based studies of pre-school children, with available findings suggesting a prevalence of just over 8% in Norway (21), 10%-12% in the UK (15, 16) and 9-14% in the US (22).

1.3 Risk factors associated with EBD in childhood

International research has consistently identified the first six years of life as being of particular importance to a child's social, cognitive, emotional and physical development (22-24). There are a number of risk factors associated with EBD in children, many of which begin in infancy and early childhood (25-27). These are summarised here and explored in more detail in Chapter Two.

There is evidence to suggest that pre-term children or children who have had complications at birth, exhibit a higher prevalence of EBD than other children in the general population (28, 29). Studies have also shown that having a difficult temperament as a baby can predict childhood EBD (28-30). Moreover, research points to a clear gender difference in the prevalence of different subtypes of EBD: girls tend to have higher levels of internalising behaviour (such as depression and anxiety) than boys, whilst externalising behaviour (conduct problems) is typically higher in boys (27, 30, 31). Physical ill-health in childhood has also been shown to be associated with an increased risk of EBD (27). A range of studies have reported a co-existence between specific learning difficulties (SLD) and EBD in children and adolescents (32, 33). Existing evidence also highlights an association between childhood experiences of bullying and an increased prevalence of anxiety, depression, self-harm and other psychiatric disorders among adolescents (34-36).

There is considerable evidence to show that a number of parental risk factors are also associated with EBD in childhood. One of the most significant developments during the first year of the child's life, is the development of an attachment relationship to the primary caregiver, usually the mother (37-39). Considerable research on parenting has identified parenting style to be an important facilitative or inhibitive factor in the healthy development of child emotional well-being (40, 41). Several studies have also found that maternal depression can have a negative impact on children's behavioural outcomes (42-44). For instance, the EDEN mother-child birth cohort study found that children whose mother had persistent symptoms of depression were more likely to have high levels of EBD than children whose mothers were never depressed (45).

Severe or chronic illness in parents has also been associated with problem behaviour in children (46, 47), whilst high levels of parenting stress are related to children's EBD (48-50). Parents' unhealthy behaviours (smoking during pregnancy or misusing alcohol) also can have a negative impact on children's mental health (51, 52).

The loss of a parent is considered one of the most severe childhood traumas and has been shown to increase the risk of depression in children and adolescents (53, 54). Parental divorce or separation is another factor associated with EBD in children and adolescents. Additionally a large number of studies have found that exposure to domestic violence has strong adverse outcomes for children, resulting in increased levels of aggression, depression, anger, and anxiety (55-58). Furthermore, many environmental adversities such as poverty (59, 60), lone-parent households (61) and unemployment (16) are also associated with EBD in children and adolescents.

1.4 Life course implications of EBD in children

In 2017, almost 2,500 Irish children were on the Child and Adolescent Mental Health Services (CAMHS) waiting list, some of whom had been waiting for more than a year to be seen by the CAMHS team (62). Early childhood problems can lead to developmental trajectories that become progressively more difficult to modify as children get older (6). Persistent antisocial behaviour substantially increases the likelihood of problems in adulthood such as violence, criminality, unstable relationships and EBD (63-65). It has also been shown that EBD has been associated with increased risk for psychiatric illness and substance abuse problems, increased risk of alcohol dependence as adults, and teen pregnancy (63, 65, 66). Kessler *et al.* revealed that about half of all adults with mental disorders recalled that their disorders began by their mid-teens (66).

Approximately half of all students with childhood EBD leave education prematurely (67). The effect of early school leaving has important implications for the individual in terms of the employment opportunities that are available to them. Adolescents with conduct problems have been shown to engage in risky sexual behaviour and/or experience teenage pregnancy (68). A study conducted by Pajer *et al*. comparing a matched sample of adolescent girls with and without conduct problems, found that adolescent girls who exhibited antisocial behaviours had their first pregnancy at a significantly younger age, even after controlling for demographic factors and pre-existing health history (68).

As mentioned above EBD in childhood can lead to high societal costs (65). However, the economical costs associated with repeated contact with specialist educational, social welfare and medical services, the police and justice system, and various non-governmental organisations are also extensive (42, 69-71). A UK study that followed up children who had been diagnosed with ODD or conduct disorder at the age of 10 years, reported that by the age of 27 years each child had cost the state approximately £200,000, 10 times more than children without these disorders (70). In Ireland, in 2017, the personal and social costs of mental illness (including EBD) had been estimated at €11 billion (72).

1.5 Parenting Programmes

Parent training has been described as the most effective approach to the psychosocial treatment of EBD in children (73, 74) and not least because, as outlined earlier, parenting style is a major risk factor for the development of EBD in children. The NICE guidance on antisocial behaviour and conduct disorders in children and young people recommends that structured parenting

programmes should be offered to parents of a child/children aged 12 years or under whose child/children have EBD (75). Parenting programmes are generally short-term interventions, which aim to help parents to identify and cope with problem behaviours in their children by, for example, using positive reinforcement (e.g. rewards) and positive role modelling to encourage appropriate behaviour. Some of the kinds of techniques and approaches include ignoring, time-out and redirection/distraction (76-79). A number of systematic reviews of the effectiveness of parent training for EBD suggest that parenting programmes are an effective intervention for children with EBD (73, 77, 78, 80). For example, a widely-cited Cochrane review conducted by Furlong and colleagues in 2012, indicated that a number of well-known group-based parenting programmes (e.g. the Incredible Years parent training programmes) were moderately effective in improving behavioural difficulties in children aged 3-12 years with conduct problems (77). Numerous other studies have also found that structured group-based parenting programmes in particular can be effective in reducing problem behaviour in children (81-83) and improving positive parenting practices (84, 85).

In spite of the significant child, parent, and societal benefits of parenting interventions, most parents are not aware of, or do not receive, them (86). Stigma, childcare costs, transportation to the intervention, work schedules, or unwillingness to attend a group based service, prevent many parents from attending parent training programmes (86-88). A number of online programmes have become available in recent years, which attempt to address some of these barriers by allowing parents to access programmes from their own homes, thereby increasing accessibility and reducing potential stigma (86, 89). Traditional parenting programmes are often

targeted at lower socio-economic families or families who are considered to be at risk, whereas the internet can be a source of information and support for larger groups of parents, thereby ensuring that they are more widely available to the general population (90). In Ireland, almost 90% of adults with dependent children (aged <18) have access to the internet in their home (91). Thus, when compared to more traditional face-to-face parenting programmes, internet delivery has the potential to increase the reach of parenting programmes, resulting in greater cost-efficiency and enhanced capacity to tailor programme content to the needs and interest of parents (90, 92). A small number of systematic reviews have been carried out, to date, on the effectiveness of online parenting programmes. For example, Nieuwboer *et al*. in their systematic review of parenting programmes in which the primary components were delivered online, report a medium effect size, suggesting therefore, that these kinds of programmes have considerable potential (90).

Better Outcomes, Brighter Futures (2013) is the first national policy framework for children and young people in Ireland (aged 0-24 years). It discusses the need to provide both universal and targeted evidence-informed parenting supports for parents. However, it does not mention specifically the benefits or availability of online parenting programmes. In May 2018, the Irish Minister for Mental Health launched a report on e-mental health commissioned by Mental Health Reform Ireland (93). The report provides an overview of e-Mental Health applications that could be helpful for people with common mental health conditions such as mild-to-moderate anxiety and depression, as well as applications relevant for people with more severe conditions. This report however, does not mention the benefits of online parenting supports

which could potentially improve both parent and children's mental health. There appears, therefore, to be a lack of knowledge and research in the area of online parenting programmes in Ireland and internationally.

1.6 Triple P Online

The traditional (face-to-face) version of the Triple P parenting programme (94) is currently being implemented in parts of Ireland, alongside other parenting programmes such as the Incredible Years (79) and Parents Plus (95). Although this is the first time TPOL has been evaluated in Ireland, it has been evaluated in Australia, New Zealand and the United States with some promising results from published RCTs (see chapter 3). TPOL has also been implemented in Canada, China, Germany, Netherlands, Singapore, Turkey, and the UK, although studies of its feasibility or effectiveness have yet to be published in these countries.

TPOL includes eight modules which include the following: (1) 'What is Positive Parenting?'; (2) 'Encouraging Behaviour You Like'; (3) Teaching New Skills; (4) 'Managing Misbehaviour'; (5) 'Dealing with Disobedience'; (6) Preventing Problems by Planning Ahead, (7) Making Shopping Fun, and (8) Raising Confident Capable Kids (83). TPOL has been described as one of the top five digital mental health programmes in the world (from among 100 different reviewed digital products) (96) and is one of the few online, parenting programmes available that can be accessed without facilitator support. It is therefore, an intervention that should be examined in more detail to establish its potential benefits as a cost-effective parenting intervention.

1.7 Thesis aims and objectives

The overarching aim of this research was to identify early risk factors of EBD in Irish children and to test the feasibility of implementing a parenting intervention to prevent or reduce EBD in this cohort. The specific objectives of the study were: (1) to investigate the extent of emotional and behavioural difficulties (EBD) in early childhood (5-year-old children) and their associated risk factors; (2) to explore the extent of EBD in young teenagers (13-year-old adolescents) and their associated risk factors; and (3) to assess the feasibility of implementing an online parenting programme to reduce EBD in children.

Study 1 assessed the prevalence of EBD in five-year-old children, the characteristics of these children were examined and the risk factors associated with EBD within this cohort were investigated, using data from a national longitudinal study. Similarly Study 2 assessed the prevalence of EBD in 13-year-old children, the characteristics of these children were examined and the risk factors associated with EBD within this older cohort were investigated, using data from a national longitudinal study. Finally a feasibility study of an online parenting intervention (Triple P®) for parents of children with EBD compared with usual intervention was conducted.

1.8 Study Rationale

This is the first European study to involve a longitudinal analysis of maternal, paternal, family and child risk factors associated with EBD in early childhood and adolescents. Fathers are often excluded from parenting studies, but both mothers' and fathers' (77% of fathers) characteristics

and behaviours were examined here. This research is important in helping to clarify the types of risk factors associated with EBD in children and adolescents and therefore, how best we might intervene to help improve this aspect of their lives. Furthermore, while parenting programmes have been widely evaluated, little is known abouut the effectiveness of online versions. This study represents the first time in which an online parenting programme (TPOL) (without the assistance of a facilitator) has been evaluated in an Irish setting and also the first time in which TPOL has been tested in a European context. The results of this study are important in helping to inform best practice for improving the outcomes of children with EBD.

1.9 Outline of Thesis

Chapter Two is the first of two literature review chapters; it provides a review of the literature on the risk factors associated with EBD in children and adolescents. Risk factors associated with EBD can be grouped into three categories including those present in childhood, in parents and in the wider family context and background. Each of these were described in this chapter, followed by an overview of the intergenerational continuity of parenting practices and the life course implications of EBD.

Chapter Three reviewed the literature on parenting programmes. Firstly an overview of parenting programmes was presented. The results of the most recent systematic reviews on the effectiveness of parenting programmes in reducing EBD was discussed. The series of Triple P programmes was then described, followed by a critical evaluation of the evidence on their effectiveness, including the online versions.

Chapter Four describes the methodology underpinning all of the studies on which this research was based including the Growing up in Ireland (GUI) cohort studies (Studies One and Two) and the feasibility study (Study 3). The epistemological framework which informed the research, was described first.

Chapter 5 presents the results of Study 1. Study 1 used GUI data to identify the prevalence of EBD in Irish children and establish whether risk factors identifiable in infancy (nine months) and early childhood (three years) can predict emotional and behavioural outcomes in five-year-old children.

Chapter 6 displays the results of Study 2. Study 2 involved an analysis of GUI data to identify the prevalence of EBD in Irish children and investigate the extent to which risk factors identifiable in 9-year-old children can predict emotional and behavioural outcomes in 13-year-old children.

Chapter 7 describes the feasibility and acceptability of TPOL. Information was presented on the feasibility of recruitment, adherence to the intervention, acceptability of the intervention as well as preliminary estimates of clinical outcomes with respect to child behaviour, parenting skills, mood, and family functioning.

Chapter 8 discusses the findings from both cohort studies and the feasibility study in the context of previous research, their strengths and limitations are presented, the implications of the findings for policy and practice are examined and conclusions drawn along with recommendations for further research.

Chapter 2 Risk factors associated with EBD in childhood: A review of the literature

Risk factors are defined as measurable predictors of negative outcomes which often represent a direct threat to the development of the individual regardless of the context in which they occur (23). There are a number of risk factors associated with EBD in children, many of which begin in infancy and early childhood (97). Indeed, international research has consistently identified the first six years of life as being of crucial importance with regard to healthy cognitive, physical, social and emotional development (98, 99), with more recent research suggesting that the "first 1000 days" are the most critical in terms of brain development as well as other developmental aspects (24). Unsurprisingly, therefore, childhood adversity in the first five years accounts for more than 30% of psychosis in adulthood (100); it also predicts the onset of smoking and illicit drug use in adolescence and is related to an increased risk of entry into the criminal justice system (70, 101).

Risk factors associated with EBD can be grouped into three categories including those present in childhood, in parents and in the wider family context and background. Each of these is described below, followed by an overview of the intergenerational continuity of parenting practices and the life course implications of EBD.

2.1 Search strategy

MEDLINE, PsycINFO, Pubmed, and Cochrane academic databases were searched using key search terms. These included 'behavioural difficulty', 'behavioural disorders', 'behavioural problems', 'problem behaviour', 'conduct disorder', 'externalising problems', 'internalising problems', 'emotional problems', 'emotional difficulty', 'anxiety disorder', 'children', 'adolescents', 'youth' and 'risk factors'. Article reference lists, Google Scholar and grey literature were also searched.

2.2 Childhood risk factors

A number of risk factors present in infancy have been associated with EBD in early childhood, in the same way as risk factors identifiable in later childhood have been associated with EBD in adolescents. For example, some evidence would suggest that pre-term children, or children who have had complications at birth, are more likely to experience EBD than the overall population (28). However, birth complication are more likely to lead to EBD when combined with psychosocial risk factors, such as a disadvantaged family environment and poor parenting (28, 29). Studies have also shown that having a difficult temperament as a baby can predict early childhood EBD (28-30). For example, in a large US longitudinal study, Edwards and Hans (2015) assessed infants and their primary caregivers (n=412) over three time points - when the child was five months, two and a half years and five-years-old. They revealed that infants with high levels of anger/frustration were at greater risk of developing externalising problems when compared to infants without such issues. They also revealed that half the children in the study

who had behaviour problems at age two and a half years continued to have such problems at age five. However, having a 'difficult' temperament does not necessary lead to problem behaviour, but it may be a factor which interacts with other risk factors to make it more likely that children will behave anti-socially when they are older (64). Conversely, having an 'easy' temperament can act as a protective factor for children who have experienced other risk factors in their lives (64).

Physical ill-health in children and adolescents has also been shown to be associated with an increased risk of EBD (11, 102, 103). For instance, in an Australian longitudinal study which examined the predictors of EBD in childhood, Bayer *et al*. reported that children who had a physical illness were more likely to suffer from emotional problems than their physically healthier counterparts (27). Furthermore, a wide range of studies have described the co-existence of specific learning difficulties (SLD) and EBD in children and adolescents (32, 33). In a Norwegian study, Knivsberg and Andreassen (2008) stated that significantly more emotional, behavioural and attention problems were present in children with severe dyslexia than a matched control group, based on parent, child and teacher reports. Similarly, Willcutt and Pennington in a study in Colorado, revealed that sets of twins with reading disabilities (n=209) exhibited significantly more EBDs than controls (n=192) (104). McGillivray and Baker go further and suggest that the co-existence of learning difficulties and ADHD in childhood and adolescence, is a leading predictor of mental health disorders, (such as anxiety and depression) in adolescence and adulthood (105). Furthermore, Bayer *et al*. in their Australian longitudinal

study, revealed that children with speech and language difficulties were more likely to have emotional problems than children without such difficulties (11).

As adolescence is a difficult period of development between the ages of 10 and 19 years (106), some risk factors are associated more with this age group than younger children. Studies have highlighted an association between childhood experiences of bullying (traditional and cyber) and an increased prevalence of anxiety, depression, self-harm and other psychiatric disorders among adolescents (34, 107, 108). In a recent Irish study, it was found that 39% of 13-16 year olds in a nationally representative prospective cohort study of 1,112 school-based adolescents, reported being bullied (109). This study focused on traditional methods of bullying (teasing, spreading rumours, ignoring etc.). Notably, Kelleher *et al*. demonstrated an interesting dose-response relationship between childhood bullying and psychotic experiences, with the odds of psychotic experiences increasing in line with increasing levels of bullying (109). They also demonstrated that a cessation in bullying was associated with a cessation of psychotic experiences in individuals who had been exposed to bullying (109). Lataster *et al*. reported similar findings in a cohort of 13-14-year-old secondary school children in the Netherlands (n=1,290), in which they found that the risk of developing non-clinical psychotic experiences increased with a greater frequency of bullying experiences (107). Furthermore, Fleming and Jacobsen (2010) examined the prevalence of bully victimisation in school children in 19 low- and middle-income countries and demonstrated that students who were bullied in the past month were more likely than non-bullied students to recount feelings of sadness, hopelessness, loneliness, insomnia, and suicidal ideation (35). Though these findings are interesting, the bullying described in the above studies

focused primarily on the more traditional forms of bullying, more longitudinal research into the effects of cyber and internet bullying on EBD is warranted.

Research also points to a clear gender difference in the prevalence of different subtypes of EBD; girls tend to have higher levels of internalising behaviour (e.g. depression and anxiety) than boys, whilst externalising behaviours (conduct problems) are more commonly described in boys (11, 14, 30, 31). Numerous studies report a higher prevalence of EBD in boys in early childhood (30, 31, 60) with the prevalence rate of girls increasing during adolescence and reflecting that of boys during this period (13). However, there appears to be a scarcity of research on gender issues and EBD. What is out there tends to focus largely on the prevalence rates of EBD in boys and girls and identifies the types of behaviours exhibited (externalising and internalising) (110). Few studies have, however, looked at how the risk factors associated with EBD differs by gender. Further research is required in this area.

2.2 Parental risk factors

There is considerable evidence to show that there are a number of parental risk factors associated with EBD in both childhood and adolescence. One of the most significant developments during the first year of the child's life, is the development of an attachment relationship to the primary caregiver, usually the mother (111). A number of studies have described an association between insecure infant attachment and EBD in childhood (41, 112). For example, the Minnesota Parent-Child Project, a longitudinal study on the development of children in early childhood (N=1,364) showed that insecure attachment at 12 and 18 months, increased the risk of EBD for pre-schoolers (30).

It is also important to examine how parenting style can impact on the emotions and behaviours of children and adolescents. Research into parenting has looked at, amongst other things, the kinds of parenting styles that are most effective in promoting positive emotional wellbeing in children and adolescents (41). Traditionally, three types of parenting styles have been identified according to the extent to which parents demonstrate high or low levels of warmth and firm control (40). 'Authoritative' parents have high levels of both of these attributes, whilst authoritarian parents have high levels of firm control but low levels of warmth; permissive parents, on the other hand, have high levels of warmth and low levels of control (40). In their longitudinal study, Braza *et al*. followed 89 Spanish children over two time points: when they were five to six- years- old and again when they were eight to nine--years-old, and examined the effects of negative maternal and paternal parenting styles respectively on children's behaviour (41). They revealed that only maternal parenting styles had any main effects on behavioural problems in their children. Other studies, however, have contradicted this finding and suggest that insensitive and/or harsh parenting from either parent can impact negatively on a child's mental health (11, 27, 113-115).

Parental mental health is another important risk factor associated with EBD in childhood and adolescence (43, 44, 116, 117). For example, the EDEN mother-child birth cohort study revealed that children whose mother had persistent symptoms of depression, were more likely to have high levels of EBD than those children whose mothers had no mental health difficulties (44). Likewise, there is considerable evidence to suggest that there is a strong association between paternal depression and EBD in early childhood and adolescents (43, 116, 117). The findings

from Families, Children and Child Care study in the UK - which involved 1,201 parents and their babies, indicated that fathers' mental health problems, when present during their child's preschool years, adversely affected socio-emotional behaviour in both boys and girls at school entry (118). However, while many children and adolescents with a depressed parent do experience mental health difficulties others exhibit no difficulties at all (9, 117). For example, in two recent UK studies that examined the mental health outcomes of adolescents with depressed parents, it was identified that parental warmth, support and responsiveness were strongly associated with adolescent mental health resilience (9, 117).

A number of studies have examined the association between parental stress and EBD in early childhood and report that parenting stress significantly contributes to EBD (48-50, 119). However, Tharner *et al*. in their population-based cohort study of infant attachment and parenting (n=606) in the Netherlands, revealed that parenting stress was related to more aggression and attention problem behaviours in insecurely attached children, but not in children who had formed secure parent-child attachments. They concluded that attachment security in infancy buffers the influence of parenting stress on childhood EBD (39).

Additionally, severe or chronic illness in parents has been associated with problem behaviour in children and adolescents (120-122). Harland *et al*. stated that children of cancer patients, in particular adolescent girls of sick mothers, were more likely to suffer from stress and emotional problems than children of healthy parents (121). This finding is mirrored in research based on parents with other physical health problems (47). However, longitudinal studies which focus on

the impact of parental physical illness on the mental health and well-being of young children are limited. A need for further research is indicated.

Unhealthy behaviours may also have a negative impact on children and adolescents. Children who experience alcohol abuse can be particularly vulnerable to EBD (123-126). For example, Edwards *et al*. examined the relationship between paternal alcoholism and toddler behaviour in a sample of 176 children, and stated that children with alcoholic fathers had higher levels of EBD than children of non-alcoholic fathers (38). Interestingly, however, they also stated that children with secure relationships with their mothers had significantly lower externalising problems than insecure children of alcoholic fathers. Therefore, positive maternal parenting appears to mediate some negative childhood experiences. Additionally, smoking during pregnancy has been associated with EBD in young children (51, 52). The results of a large Norwegian longitudinal study which examined the behaviours of 22,545 mothers who had an 18-month-old baby revealed that smoking during pregnancy increased their child's subsequent risk for externalizing behaviour problems (52).

2.3 Family risk factors

A number of family risk factors have been associated with EBD in children and adolescents. Loss of a parent or an immediate family member is considered one of the most serious childhood traumas and has been shown to increase the risk of depression in both children and adolescents (53, 54). In their study, Gray *et al*. revealed that 25% (n=85) of US adolescents suffered a major depressive episode two months after parental bereavement (53). Furthermore, in a more recent prospective longitudinal study which tracked Dutch adolescents (n=2,230) to assess change in

mental health following bereavement, revealed that adolescents who experienced such loss reported more emotional problems, within two years after the bereavement, compared to their non-bereaved peers (54).

Parental divorce or separation is another factor associated with EBD in children and adolescents. Lansford examined children's EBD from one to three years following parental separation, and revealed that separation/divorce was related to increasing EBDs (127). However, Ferguson *et al*. showed that much of the association between poor behavioural outcomes in children after a family break-up was due to confounding factors in the family (61). This is supported by Mechanic and Hansell (1989), who suggest that conflict between parents, and not parental separation *per se*, impacts on the EBD of children (128). Jekielek suggests that after taking baseline levels of anxiety and depression into account, children can benefit emotionally from parental separation in high conflict families (129). Furthermore, Harold *et al*. (date) suggest that when inter-parental conflict is present, parenting programmes are much less effective in improving children's mental well-being (130). Collectively, these findings suggest that additional longitudinal research is required to understand how parental conflict and separation impact children as they get older.

It is also well documented that exposure to domestic violence has strong adverse outcomes for children, resulting in increased levels of aggression, depression, anger, and anxiety (55-57). For example, Evans *et al*. used meta-analysis to examine the relationship between childhood exposure to domestic violence and children's outcomes (55). They examined 60 studies and reported that there was a positive moderate association between exposure to domestic violence

and EBD in children. Likewise, Huang *et al*. stated that children (n=5,000 families) who were exposed to domestic violence when they were aged 12 months, had a greater risk of developing EBD at age five than children who were not exposed to such violence (57). However, the findings of other studies suggest that it is not the child's exposure to violence per se that increases their risk of EBD, but rather the negative impact of domestic violence on parental mental health (59, 115).

Many other broader environmental factors such as poverty (59, 60), single parent households (61) and unemployment (16) are also associated with EBD in children and adolescents. It is now well known that the prevalence of EBD may be as high as 25% in areas characterised by high levels of socioeconomic disadvantage (14). Children in the poorest households are three times more likely to experience EBD than children in more advantaged homes (131), while severe behaviour problems are three to four times more common in poor families from poor neighbourhoods (131). Furthermore, families living in deprivation are more likely to experience stress in their lives, which, in turn, affects their mental health and, therefore, a parent's ability to parent (131).

Although a number of risk factors were discussed in this chapter, there is no single risk factor which leads to EBD in early or later childhood. In fact, evidence would suggest that children exposed to a number of adverse life events or risk factors are more likely to have EBD than children exposed to one risk factor (31). Cumulative or multiple risk models propose that children's developmental outcomes are best predicted by examining the accumulation of risk

factors rather than focusing on a single risk factor (132-134). For example, a UK study of 10 year-old children found that most who experienced a single physical or psychosocial risk factor suffered little if any enduring harm. However, children experiencing two or more risk factors, were much more likely to experience psychological disorder (133). Table 2.1 illustrates the child, parental and family risk factors associated with EBD based on the literature review described above.

TABLE 2-1 CHILD, PARENTAL AND FAMILY RISK FACTORS ASSOCIATED WITH EBD

Child	Parental	Family
Gestation	Parent/child attachment	Death of a parent
Temperament	Parenting style	Divorce/separation
EBD	Parental mental health	Parental conflict
Physical ill-health	Parental stress	Income
Specific Learning Difficulty (SLD)	Physical ill-health	Employment
Speech problem	Alcohol/drug misuse	Family structure
Bullying	Smoking during pregnancy	
Self-esteem		
Screen-time		
Gender		

2.4 Intergenerational continuity in parenting

Little is known about how parents come to behave the way they do toward their children (135). It has been suggested that continuities in parenting practices across generations may exert a significant influence on parenting style, practices and strategies (135, 136). Indeed, there is growing evidence that the style of parenting in one generation influences parental behaviour in the next and especially with regard to parental harshness/hostility (137). Belsky *et al*. in their longitudinal study, discovered that mothers who experienced more supportive parenting in their own childhood, were more supportive when parenting their own children (138). Furthermore,

attitudes about parenting prior to parenthood, especially those related to harsh discipline and warm parenting, have been shown to be strong predictors of the quality of the mother–infant relationship (139, 140). An interesting study by Lounds *et al*. report that knowledge about child development and attitudes about warm parenting and harsh discipline, when measured prior to parenthood, predicted later secure attachment between mothers and their one-year-old children (140).

Parenting practices have been shown to be more or less consistent across generations (141). However, Schofield *et al*. suggest that two parents in the same family tend to influence one another's child-rearing behaviours, such that when one parent has experienced a history of harsh parenting, they are less likely to practise these behaviours with their own children if their partner is warm and supportive toward the children. The same authors, in a later meta-analysis (involving five longitudinal follow-up studies) found that a safe, stable, and nurturing relationship, with other adults, moderated the inter-generational transmission of poor parenting (143). They argue that prevention or intervention programmes aimed at disrupting the inter-generational continuity of harsh parenting should focus on co-parents as well as parent-child relationships and suggest that improving the practices of one parent, can often lead to a positive carry-over effect for the co-parent.

2.5 Life course implications of EBD in children

Research suggests that problems in the early years of childhood may lead to problems in adolescence and adult life (143). A New Zealand longitudinal study of mental health outcomes

reported that impulsive three-year-olds had higher rates of persistent antisocial behaviour at age 21 years, while shy children had higher rates of depression at the same age (65).

Persistent antisocial behaviour substantially increases the likelihood of problems in adulthood such as violence, criminality, unstable relationships and EBD (63-65). It has also been shown that EBD has been associated with failure to complete secondary school, increased risk for psychiatric illness and substance abuse problems, increased risk of alcohol dependence as adults, and teen pregnancy (64, 65). Kessler *et al*. revealed that about half of all adults with mental disorders recalled that their disorders began by their mid-teens and three-quarters by their mid-20s (66).

Approximately half of all students with childhood EBD leave education prematurely (66, 67). The effect of early school leaving has important implications for the individual in terms of the employment opportunities that are available to them. Adolescents with externalising behaviour have been shown to engage in risky sexual behaviour and/or experience teenage pregnancy (68). A study conducted by Pajer *et al*. comparing a matched sample of adolescent girls with and without conduct difficulties, found that adolescent girls who exhibited antisocial behaviours had their first pregnancy at a significantly younger age, even after controlling for demographic factors and pre-existing health history (68).

2.6 Conclusion

Evidence suggests that there are a number of child and parental risk factors associated with EBD. Risks for behaviour problems in young children may be present as early as infancy when children

are first engaging with their parents and family environment. A number of studies have focused on a particular risk factor (such as maternal depression) and its impact on EBD in childhood, but few studies have considered child, maternal, paternal and family risk factors and their impact on child and adolescent EBD. Understanding the risk factors associated with EBD can help policy makers tackle anti-social behaviour by identifying problems in childhood. Although a number of risk factors were discussed in this chapter, there is no single risk factor which leads to EBD in early or later childhood. In fact, evidence would suggest that children exposed to a number of adverse life events or risk factors are more likely to have EBD than children exposed to one or two risk factors (31). This would suggest that preventive programmes are more likely to succeed if they are designed to deal with multiple risk factors (64). However, there is a lack of longitudinal research on the association between multiple child, parental and family risk factors and EBD in early childhood and adolescents. The studies presented in this thesis (study one and two) aimed to address this gap. This chapter has examined the risk factors associated with EBD from birth onwards and although many challenges exist in the prevention or reduction of EBD, a number of evidence-based parenting programmes have been shown to be effective in Ireland (76, 82, 144). The next chapter examines the literature on the effectiveness of parenting programmes in reducing or preventing EBD in children and adolescents in a national and international context.

Chapter 3 Parenting programmes and their effectiveness: Review of the literature

3.1 Overview of parenting programmes

Early intervention and prevention with children and families is widely recognised (73, 76, 81, 144) as important in promoting mental health and wellbeing, minimising risk factors and setting children on successful developmental trajectories (14, 82, 85, 145). Parent training is recommended as the most effective first line approach to the psychosocial treatment of conduct problems in children (1-3). For example, the NICE guidance on antisocial behaviour in children and young people, recommends that structured parenting programmes should be offered to parents of children aged 12 years or under whose children have conduct disorder (75). In addition, a number of recent Irish studies/papers have pointed to the need for interventions aimed at supporting the family and, more specifically, enhancing parenting skills in the earliest years (14, 81, 85, 144, 146).

Parenting programmes are generally structured, short-term interventions typically delivered in group settings and designed to help parents manage or cope with their child's emotional and behavioural development (147). They help parents to identify problem behaviours and to use positive reinforcement, such as rewards, to encourage desirable behaviour, whilst using techniques such as ignoring, time-out, or redirection in the case of a younger child, to discourage undesirable behaviour (78). All evidence-based parenting programmes emphasise the need to

build and maintain a warm and nurturing relationship between parent and child, so that the child feels recognised as an individual, loved and supported (79, 148).

There has been a rapid expansion in group-based parent training programmes over the past 10 to 15 years (73). A number of systematic reviews of the effectiveness of parent training for children with EBD, suggest that parenting programmes are an effective intervention for children with such problems (more detail about these programmes and their effectiveness are described below). The benefits include fewer emotional and behavioural difficulties in children, as well as benefits for the parents themselves, including more effective parenting practices, improved parental mental health, and less parental conflict (14, 73, 77, 84).

Working with groups offers a number of advantages in being able to reach larger number of parents during a session (compared to individual work) whilst also encouraging interaction between the parents who attend (149). Gaining new skills and understanding, together with peer support from other parents in the group, are shown to lead to parents feeling more in control and better able to cope (150). Structured parenting programmes delivered in group settings have also been shown to reduce parental anxiety, stress and depression, and improve parenting skills (149).

3.2 Evidence on the effectiveness of parenting programmes

Over the years, numerous studies across the world have contributed to our understanding of how parenting programmes can reduce EBD in children (80, 82, 84). The findings from selected

studies have been synthesised, critiqued and analysed in a number of systematic reviews and meta-analyses (73, 77, 151, 152). The results of the most recent systematic reviews are outlined below. These are based on the effectiveness of selective (targeted) rather than universal parenting programmes. Selective programmes are specifically aimed at subgroups of children who have been identified as being at risk, such as children who have, or who are at risk of, developing EBD. The results are presented as effect sizes with 95% confidence intervals (CIs) and in the form of standardised mean differences (SMDs). The SMD is used as a summary statistic in meta-analysis when the studies all assess the same outcome but measure it in different ways. If they are measured in different ways, it is therefore, necessary to standardise the results of the studies to a uniform scale before they can be combined (153). For the reviews below, a minus SMD indicates that the result favours the intervention. Six systematic reviews have been examined below, three of which review studies which assess the effectiveness of parenting programmes in reducing children's emotional and behavioural difficulties, two reviews look at the effectiveness of parenting programmes in reducing children's behavioural difficulties only and one review assesses the effectiveness of parenting programmes in reducing children's emotional difficulties only.

Dretzke and colleagues (73) in their 2009 systematic review, summarised the findings from 57 randomised controlled trials (RCTs) of parenting programmes designed to specifically target behavioural difficulties in children and young people under the age of 18, programmes with different modes of delivery (group-based, individual and self-directed) were included. The authors' aims were to investigate, firstly, the overall effectiveness of parenting programmes and, secondly, the effectiveness of different delivery approaches. Twenty-four studies measured

outcomes following programme completion using two parent-report measures – Eyberg Child Behaviour Inventory (ECBI) (n = 20) and the Child Behaviour Checklist (CBCL) (n = 4). The ECBI is a parental report of conduct problems in children and adolescents that measures the number of difficult behaviour problems (intensity) and the frequency with which they occur (73).The CBCL is a measure reported by parents to rate their child's problem behaviours and competencies (73). The results of all 24 studies were combined using a random effects model and showed a significant SMD favouring the intervention group of -0.67 (95% CI: -0.91 to -0.42). The authors, however, found only seven studies which provided an independent assessment of outcomes (e.g. based on observation in the home); this is perhaps not surprising given the more significant resource implications of undertaking such work. The authors combined the results for all seven studies using a random effects model and the combined data showed a significant SMD (-0.44) favouring the intervention group (95% CI: -0.66 to -0.23). This suggests that the effect of parental training on child and adolescent behaviour is smaller when reported by an independent assessor than when reported by the parent (-0.44 compared to -0.67), albeit this result is based on only a very small number of studies which included outcomes based on observational approaches. With regard to the effectiveness of different approaches (group-based, individual or self-directed) to parental training (based on 28 RCTs), the authors found insufficient evidence to suggest that any one approach to delivery was better than another. They concluded that parenting programmes are an effective treatment for children with behavioural difficulties, although the relative effectiveness of different approaches requires further research.

A few years later, in 2012, Furlong and colleagues (77) conducted a (widely cited) systematic review of the effectiveness of group-based parenting programmes for children (aged 3 – 12

years) with conduct problems. Thirteen randomised and quasi-randomised controlled trials were identified as eligible for inclusion in the review, all of which were based on parent or independent report of child behaviour (which were considered separately). The 13 studies using parental report instruments, provided data for a total of 1,024 participants. The overall effect for the meta-analysis favoured the parent training, with an SMD of -0.53 (95% CI: -0.72 to -0.34). The overall effect for the meta-analysis using independent reports (n=9) favoured parent training, indicating statistically significant moderate benefits, with an SMD of -0.44 (95% CI: -0.77 to -0.11). These results indicate that group-based parenting programmes were moderately effective in improving conduct problems in children, although as in the case of Dretzke *et al*. the overall effect was smaller when reported by an independent assessor. The overall effect size identified in the meta-analysis for the secondary outcome - child emotional problems (based on parent report) - indicated a small, statistically non-significant effect size, SMD = 0.16 (95% CI: -0.18 to 0.50). Furlong *et al*. concluded from the collective findings, that group-based parenting interventions appear to be effective in improving conduct problems, but not emotional difficulties in children.

A more recent systematic review and meta-analysis evaluating the effectiveness of parent training group interventions to treat EBD in children was conducted in 2017 by Buchanan-Pascall (80). In this instance, the authors identified 23 RCTs of parent group interventions aimed at reducing EBD in children aged 4–12 years (N=2197). Of the 23 studies which met the inclusion criteria, 20 reported behavioural outcomes and 14 reported emotional outcomes, with 11 studies reporting both. Sixteen studies were included in the meta-analysis to assess the effect of

parent group treatment on behavioural difficulties. The mean effect sizes for child behavioural difficulties was SMD=−0.38 (95% CI -0.56 to -0.19) which indicates a statistically significant small treatment effect for parent group treatment over control for child externalising problems. Thirteen studies were included in the meta-analysis measuring the effect of parent group treatment on emotional difficulties. The mean effect size for child emotional difficulties was SMD =−0.18 (95% CI: -0.36 to-0.01). The above results indicate that parent group intervention programmes are effective in improving child behavioural difficulties, with a significant and small treatment effect size, while the second meta-analysis showed a statistically significant reduction in child emotional difficulties, albeit with a more modest effect size. Buchanan-Pascal *et al*. concluded that their findings support the use of parent group interventions as an effective treatment for reducing behavioural problems in children aged 4–12 years. However, as in the review by Furlong *et al*, the programmes had only a limited impact on reducing emotional difficulties in this age-group.

The results of a meta-analysis of the Parents Plus (PP) parenting programme (76) - developed in Ireland - showed that the programmes had a significant positive impact on child behaviour problems. The mean effect size for child behavioural problems was SMD= 0.57 (95% CI 0.36 to 0.79). The effect size of 0.57 from this meta-analysis compares favourably with those from other meta-analyses of both the Incredible Years (154) and the Triple P (148) parent training programmes.

Barlow *et al*. conducted an interesting systematic review in 2016, which assessed, for the first time, the extent to which group-based parenting programmes were effective in preventing and treating the emotional and behavioural adjustment of very young children under the age of four (155). They identified 22 RCTs and two quasi-RCTs, comprising a total of 3,161 parents and children. They reported a significant post-intervention improvement in the treatment versus control group with regard to total emotional and behavioural difficulties (SMD=-0.81, 95% CI -1.37 to -0.25) based on parent-reported data, although the effect size was smaller (-0.67) and non-significant (95% CI -1.43 to 0.09) when two quasi-RCTs were removed as part of a sensitivity analysis. Subscale scores for externalising problems showed a small difference favouring the intervention group based on parent reports (SMD=-0.23, 95% CI -0.46 to -0.01). The authors concluded that these findings provide tentative support, based on parent-reported data, that group-based parenting programmes can improve the overall behaviour of children aged up to four years (approximately) immediately post intervention.

A further systematic review conducted by Yap *et al*., examined the long-term effects of preventive parenting interventions for children with emotional problems (152). The 37 studies which were included in the meta-analysis, examined whether parenting interventions were effective in preventing or reducing emotional difficulties in children in the longer-term. Their results showed that, parenting interventions reduced emotional difficulties in children (when compared to controls), at a minimum of six months after the intervention was delivered (SMD=−0.12 (95% CI −0.205 to −0.042)). However, the mean effects were very small and were similar, in fact, to those reported by Buchanan-Pascal *et al*. One of the key questions addressed

in this review was the longer-term maintenance effects. When they examined the mean effects of parenting interventions at different follow-up intervals (6–10 months, 10–12 months, 12–24 months, 24–48 months, and 48 months), the authors found very small, but significant mean effects for emotional difficulties at 6–10 months and at 24–48 months. However, the authors indicate that this finding should be interpreted with caution because too few studies assessed diagnostic outcomes.

The collective findings described above suggest that parenting programmes are effective in reducing behavioural difficulties in children. However, further investigation is needed to establish their effectiveness with regard to emotional problems. The findings also suggest that perhaps traditional parenting programmes focusing on behavioural difficulties should be adapted accordingly for parents with children who have emotional difficulties. In addition, the longer-term effectiveness of parenting programmes is still unclear. None of the systematic reviews discussed above identified any follow-up study of parenting programmes, which compared intervention and control groups beyond three months post-treatment. A number of evaluations of the longer-term effects of parenting programmes alone, without a control condition at follow-up, have been conducted and have reported follow-up periods longer than one year indicating retention, or further improvement, of treatment gains (69, 85). However, as Furlong *et al*. point out, although these findings are useful, it is difficult to draw conclusions in the absence of control groups against which to compare the results (77).

Some of the most widely evaluated parenting programme include the Incredible Years parenting programmes (79), the (Irish) Parent Plus programme (76) and the Triple P parenting programme (78). The last of these was the focus of this study because it is the only programme that provides online parenting support. In the next section, the series of Triple P programmes will be described, followed by a critical evaluation of the evidence on their effectiveness, including the online versions.

3.3 Triple P parenting programme

The Triple P Positive Parenting Programme was developed in Australia (150) and, according to the developer, is a 'behavioural family intervention (BFI)', which aims to prevent EBD in children (94). Rather than being a single programme, it is described as a multi-level system of parenting support which promotes positive, caring relationships between parents and their children, and helps parents develop effective strategies for dealing with childhood EBD (78).

The Triple P suite of programmes allows parents to access different types of parenting supports in a stepped approach (78). Level 1, or 'Universal Triple P', is a communications strategy designed to reach a broad cross-section of the population with positive parenting information and messages. It provides parents with information about parenting through a coordinated media campaign using print and electronic media, as well as parenting tip sheets and videotapes that demonstrate specific parenting strategies (78). Levels 2 and 3 are brief one-to-two-session primary healthcare interventions providing guidance to parents of children with mild to moderate behavioural difficulties. Level four is for parents of children with moderate to severe

behavioural difficulties. It is available for parents of children from birth to 12 years and 13–16 years and covers parenting skills that can be adapted to a wide range of parenting situations. The level five programme is for parents whose family situation is complicated by problems such as partner conflict, stress, or mental health issues (78).

Topics covered within the Triple P programmes include positive parenting, promoting children's development, managing misbehaviour, planning ahead and implementing parenting routines (78) According to Sanders *et al*. attainment of these skills promotes family harmony, reduces parent–child conflict, fosters successful peer relationships and prepares children to be successful at school. Parents learn to apply these skills both at home and in the community. For example, in Universal Triple P, media strategies are used that involve the depiction of possible solutions to common family problems (e.g., bedtime problems). The messages provided to parents are claimed to be positive and foster the idea that even the most challenging parenting problems are solvable and/or preventable (78).

3.4 Evidence on the effectiveness of the Triple P parenting programmes

Triple P is one of the most widely researched and evidence-based interventions for treating disruptive child behaviours (96). Over the last decade, a number of meta-analyses have evaluated Triple P and have reported medium to large effect sizes on child and parent outcomes (151, 156-158). The results of the most recent systematic reviews on Triple P are outlined below. As before, the results are presented as effect sizes with 95% confidence intervals (CIs) and in the form of standardised mean differences (SMDs). Most measures used in these systematic reviews

were for the assessment of negative child or negative parenting behaviours. Therefore, negative effect sizes indicate a decline in problem behaviour (in child or parent) while positive effect sizes indicate an improvement.

The first of these reviews was conducted by Thomas and Zimmer-Gembeck (2007) and compared the outcomes of two different parenting programmes – 'Parent-Child Interaction Therapy (PCIT)' and 'Triple P' (158). They conducted a review and meta-analysis of 24 studies, to evaluate and compare the outcomes of these two parenting interventions. Eleven Triple P and thirteen PCIT studies published between 1980 and 2004 were included. For the PCIT, medium to large pre-post intervention improvements were found in observations of negative behaviour as well as increases in positive child behaviour (SMD = −0.54 and 0.94, respectively), and large effects were found when outcomes were based on mother and father reports of child negative behaviour (SMD = −.1.31 and SMD=−0.83, respectively). For Triple P, on the other hand, small to medium effect sizes were found. Both observed and parent reported negative child behaviour improved after the Triple P intervention, with effect sizes ranging from SMDs of 0.31 to 0.73. The authors found that both types of interventions reduced parent-reported child behaviour in the short-term, although any conclusions regarding the longer-term effectiveness of the interventions, remain tentative. The authors tentatively concluded that PCIT met the criteria for a "well-established treatment" while Triple P met the criteria for a "probably efficacious treatment." They did not describe Triple P as a well-established treatment because their search revealed that Triple P evaluations had not (at that point) been conducted by two independent or

investigatory teams. Independent replications of such programmes are important when assessing the extent to which they can be described as truly evidence-based.

A subsequent meta- analysis of Triple P, by De Graaf *et al.* focused on the effectiveness of Level 4 of the programme in improving parenting styles and parents' competencies (N=17) (151). All studies included in the analysis had involved the use of the Parenting Scale (PS) to assess parenting style and/or the Parenting Sense of Competence Scale (PSOC) to measure parental competence (both measures were used in eight studies). Large, statistically significant post-intervention effect sizes were found with regard to both (SMD = 0.68 (95% CI 0.48 to 0.87) and SMD=0.65 (95% CI 0.36 to 0.94) respectively, suggesting that Level 4 of the Triple P intervention is effective in reducing dysfunctional parenting styles in parents and in improving parental competency. Notably, this meta-analysis included studies that reported short to medium-term effectiveness, based on studies conducted 3 to 12 months post intervention. Again, the results indicated large statistically significant improvements in both outcomes SMD= 0.80 (95% CI 0.51 to 1.10), SMD=0.67 (95% CI, 0.43 to 0.89), suggesting that improvements in parenting style and competency were maintained over time. However, like similar meta-analyses, De Graaf and colleagues were unable to identify a follow-up study of Triple P parenting programmes involving a post-treatment control group.

At around the same time, Nowak and Heinrichs (2008) conducted a larger meta-analysis of Triple P (157). They assessed all studies (n=55) which had been conducted up until that time which had evaluated the impact of Triple P programmes on parent and child outcomes. A total of 11,797

families participated in the studies. Firstly, they looked at whether Triple P parenting programmes were effective in improving parenting skills, based on similar measures to those described above (e.g. to assess parents' attitudes toward parenting and their perceived self-efficacy as parents), but also including the extent to which conflict over child-rearing issues was present within the family. A small to medium post-intervention effect size was reported SMD=0.38 (95% CI 0.30 to 0.46). The second outcome included was child problem behaviour which was assessed using three well-known and psychometrically robust measures, including the Eyberg Child Behaviour Inventory (ECBI), the Child Behaviour Checklist (CBCL), and the Strengths and Difficulties Questionnaire (SDQ). Again, a small to medium pre-post intervention effect size was observed (SMD = 0.35 (95% CI 0.22 to 0.49)). These results are similar to those reported in earlier work by Thomas and Zimmer-Gembeck (2007) and De Graaf and colleagues (2008). Once again, however, comparisons between intervention and control groups could only be made at the 6-12mth post-intervention time point due to the lack of a control group at follow-up.

In their meta-analysis of Triple P, Fletcher and colleagues (2011) also reported the significant positive effects of Triple P on parenting (156). In this case, the authors looked at the efficacy of Triple P on improving parenting practices separately for mothers and fathers. The total number of participants across all 28 sampled studies was 5,342. When calculated separately, it was found that Triple P had a large, significant and positive impact on improving mothers' parenting, with SMD= 0.77 (95% CI 0.65 to 0.87). Triple P had a significantly smaller, but still moderate, positive, effect on fathers' parenting compared to mothers' parenting with SMD = 0.51 (95% CI 0.37 to 0.63).

In 2012, a further systematic review and meta- analysis of Triple P was conducted by Wilson and colleagues, who addressed the extent of evidence underpinning the programme (159). Interestingly, their review was much more critical of Triple P than previous reviews. They identified published studies reporting any child-based outcome in which any variant of Triple P was evaluated in relation to a comparison condition. A total of 33 eligible studies were identified. They found that most studies only reported maternal assessments of child behaviour and medium to large effect sizes were observed for child behaviour change from pre-to post-treatment (SMD =0.61 (95% CI 0.42 to 0.79)). However, the authors found that there were no reported intervention versus control group differences in this regard (SMD=0.42 (95% CI CI=0.02 to 0.87)). Furthermore, there was substantial selective reporting bias in terms of preferential reporting of positive results in article abstracts. They found that 32 of the 33 eligible studies were authored by Triple-P affiliated personnel. No trials were registered and only two papers contained conflict of interest statements. They concluded that in volunteer populations over the short-term, mothers generally reported that Triple P group interventions were better than no intervention, but there is concern about the generalisability of these results given the high risk of bias, poor reporting and potential conflicts of interest. The authors also stated that they found no convincing evidence that Triple P interventions work across the whole population or that any benefits of the interventions are long-term.

Sanders *et al.* in a systematic review conducted in 2014 (148), attempt to address some of the issues raised by Wilson and colleagues (160). Their meta-analysis examined the effects of the multilevel Triple P-Positive Parenting Programme system on a broad range of child, parent and

family outcomes. They identified 101 studies comprising a total of 16,099 families. Combining data from all levels of Triple P, they found significant short-term medium effect sizes for child behaviour outcomes (SMD =0.47 (95% CI 0.40 to 0.54)), parenting practices (SMD = 0.58 (95% CI 0.49 to 0.67)), and parenting satisfaction and efficacy (SMD = 0.52 (95% CI 0.44 to 0.60)). Significant small-to-medium effects were also found for parental adjustment, SMD= 0.34 (95% CI 0.26 to 0.43) and parental relationship, SMD= 0.23 (95% CI 0.17 to 0.29). These results suggest that, in the short-term, Triple P had a small to medium positive effect on child and parental outcomes. Sanders *et al*. also looked at the medium term effectiveness of Triple P interventions. Studies which followed participants 2 to 36 months after the intervention was completed were included in the meta-analysis. At follow-up, an overall medium effect size was found for child behaviour outcomes, SMD= 0.53 (95% CI 0.36 to 0.69), parenting practices, SMD= 0.50 (95% CI 0.36 to 0.63), parenting satisfaction and efficacy, SMD = 0.55 (95% CI 0.37 to 0.73), parental adjustment, SMD = 0.48 (95% CI 0.32 to 0.64) and child observational data, SMD = 0.40 (95% CI 0.07 to 0.73). An overall significant small effect size was found at follow-up for parental relationship, SMD = 0.23 (95% CI 0.14 to 0.33) and parent observational data, SMD =0.25, (95% CI 0.03 to 0.47). Although these results may suggest that positive child and parental outcomes were maintained over time, some important issues need to be taken into consideration before drawing firm conclusions on Triple P's long-term effectiveness. Firstly, no sensitivity analyses was carried out to take account of the variation in follow-up intervals (2-36 months) and secondly the main author of the meta-analysis was the programme developer, which again may bias the results.

Unlike previous meta-analyses, Sanders *et al*. examined developer involvement, an issue which was discussed by Wilson and colleagues in their review. They found that developer involvement was a significant moderator for one of the five main outcomes (i.e., child behaviour outcome) but, after controlling for all other moderators, was no longer significant. They also found that the 31 studies with no developer involvement, still produced significant intervention effects on the identified outcome of child behaviour. However, they did point out that over two-thirds of the quantitative studies included in their review had some level of developer involvement and suggest that more independent research is warranted.

Despite the recommendation for more independent research on its effectiveness, Triple P has been listed as an evidence-based intervention by a number of prominent organisations. For example, it has been included in the NICE guidelines on recognition, intervention and management of antisocial behaviour and conduct disorders in children and young people (75). It has also been listed by the WHO in their recommended programmes for global violence reduction (160) and has been included as a recommended programme in the UN taskforce on family-based treatment for prevention of substance abuse (161). Furthermore, in Ireland the Atlantic Philanthropies funded a population level evaluation of Triple P in the Midlands over a three year period (2010-2013). This was an independent study conducted by the UNESCO Child and Family Research Centre. It was targeted at parents of children aged 3-7 through four modes of delivery: a universal media strategy, seminars, workshops and groups (144). Statistically significant gains were observed on measures of childhood EBD and parent strategies, experiences and opinions after the Triple P rollout (144). However, the evaluation of Group Triple P and Workshop Triple P involved a quasi-experimental pre-test – post-test within-groups

design. The study did not include a control group so conclusions cannot be inferred with confidence about programme effectiveness. Nevertheless, as pointed out by the authors, because the interval between the pre-test and post-test was short and because the sample size was large, it is reasonable to infer that changes reported by parents were associated with their participation in the programme (144).

In spite of the significant child, parent, and societal benefits of parenting interventions, most parents do not receive them (92). Stigma, availability, childcare costs, transportation to the intervention setting, work schedules, or unwillingness to attend a group-based service, prevent many parents from completing parent training programmes (92). It has been suggested that online programmes offer a host of features that can address most of these barriers (89). The use of the Internet has increased rapidly since it became widely available in 1995 (90). Online programmes move the intervention outside of traditional clinics and into people's homes, increasing access and reducing stigma (90). Traditional parenting intervention programmes are often targeted at lower socio-economic families or families who are at risk (162), whereas the internet can be a source of information and support for large groups of parents (90). In Ireland, almost 90% of adults with dependent children (aged <18) have access to the internet in their home (91). Online programmes can provide parenting support to address the growing demand for parenting advice (145). When compared to more traditional face-to-face parenting programmes, internet delivery has the potential to increase the reach of parenting programmes, resulting in greater cost-efficiency and enhanced capacity to tailor programme content to the needs and interests of parents (90). In the next section, the effectiveness of online parenting programmes will be discussed.

3.5 Effectiveness of online parenting programmes

A small number of systematic reviews have been carried out on the effectiveness of online parenting programmes. For example, Nieuwboer *et al*. conducted a relatively recent systematic review of parenting programmes in which the primary components were delivered online (90). Twelve studies were included in their meta-analysis and the authors examined both parent and child outcomes. All 12 studies included 12 different online programmes and all programmes involved professional support. The authors found a statistically significant medium effect size (SMD=0.67) for improvements in parenting skills and parental knowledge. They also reported a medium effect size (SMD=0.42) in terms of improvements in child outcomes. The authors concluded that guided online interventions can make a significant positive contribution for parents and children. However, the results of this meta-analysis should be treated with caution, due to the fact that, in all but one study, the programme was developed by the researchers, which may bias the results. Additionally, studies were based on small sample sizes and no confidence intervals were reported.

In a more recent systematic review, Baumel *et al*. assessed the efficacy of digital-based parent training programmes for parents of children with disruptive behaviours when compared to a control group (89). Seven studies were included in a meta-analysis, with 718 participants. Three of the seven studies included online parent training programmes, while the other four included alternative digital formats (for e.g. downloadable podcasts, digital videos). Although the authors did not compare the efficacy of online programmes with other digital formats in this review, they did compare the effect sizes of interactive and non-interactive programmes. They found a

significant difference regarding child behaviour between the two programme types. Thus, interactive programmes had a large effect size SMD = 0.82 (95% CI 0.54 to 1.11), whereas non-interactive programmes had a small effect size SMD=0.36 (95% CI 0.05 to 0.68), when compared to control groups. These results suggest that interactive programmes (which include all the online programmes in the study) are much more effective than non-interactive programmes in improving children's problem behaviour. However, as above, this review is not without its limitations, most notably, the number of studies included in the meta-analysis was small.

Despite these possible limitations, online parenting programmes are worth investigating further. Triple P Online (TPOL) is an example of an online parenting programme that requires no professional or technical support (83). The traditional Triple P parenting programme is currently being implemented in Ireland; however, the online version of the programme has not been implemented in Ireland to date. TPOL is a self-administered computerised on-line parenting programme (83). It is an eight-module, interactive self-directed parenting programme delivered via the internet. Topics include: (1) What is Positive Parenting? (2) Encouraging Behaviour You Like, (3) Teaching New Skills, (4) Managing Misbehaviour, (5) Dealing with Disobedience, (6) Preventing Problems by Planning Ahead, (7) Making Shopping Fun, and (8) Raising Confident Capable Kids. Modules take approximately 30-60 minutes to complete. TPOL is based on the Triple P programme and was also developed by Dr Matthew Sanders. TPOL corresponds to a Level-4 intervention targeting behavioural parent training for parents whose children have moderate to severe conduct problems and who might be unable, or prefer not to, attend face-to-face programmes (83).

Two RCTs have been conducted within the last 5 years to assess the effectiveness of TPOL in improving parenting and children's behaviour. In 2012, Sanders *et al*. examined the efficacy of TPOL for parents of children with early-onset disruptive behaviour problems (83). A total of 116 parents with children aged 2 to 9 years participated in the study. They were randomly assigned to either the intervention condition (n= 60) or an internet 'use-as-usual' control group (n=56). Sanders *et al*. found that parents who received the intervention had better outcomes at post-intervention assessment than those in the control group. Parents who completed TPOL were found to have significantly better outcomes on measures of child problem behaviour ($F(2,11)=15.30$, $p<.001$); dysfunctional parenting styles ($F(3,11)=5,59$, $p=.017$); parents' confidence in their parenting role ($F(2,11)=10.51$, $p<.001$), and parental anger ($F(2,11)=5.91$, $p=.004$). At 6-month follow-up, intervention gains were generally maintained, and in some cases enhanced. The authors also found that consumer satisfaction ratings for the programme were high. However, this study had a number of limitations including most notably the involvement of the programme developer which may have biased the results (83).

In 2016, Frank *et al*. conducted an RCT which evaluated the effectiveness of TPOL in a sample of parents of pre–school children with ADHD symptoms (163). Parents were randomly assigned to the intervention group (n =27) or the delayed intervention group (n = 26). The authors found that parents who completed TPOL reported significant post-intervention improvements in child hyperactivity/inattention ($F(1,50)=9.98$, $p=0.003$), restlessness/impulsivity $F(1,50) = 7.39$, $p = .009$, defiance/aggression $F(1,50) = 6.10$, $p = .017$ and social functioning $F(1,50) = 11.24$, $p = .002$. In addition, significant improvements were reported in maternal over-reactivity $F(1,50) =$

50.01, $p < .001$; laxness $F(1,50) = 14.06$, $p < .001$; positive parenting $F(1,50) = 9.36$, $p = .004$; parenting satisfaction $F(1,50) = 20.48$, $p < .001$; self-efficacy $F(1,50) = 19.54$, $p < .001$; stress $F(1,50) = 9.71$, $p = .003$; and depression $F(1,50) = 7.60$, $p = .008$. At 6-month follow-up, effects were maintained for most outcomes. However, due to the small sample size and developer involvement the results of this study should be treated with caution.

3.6 Conclusion

The available evidence suggests that parenting programmes are effective in reducing behavioural problems in children, but evidence of their effectiveness in reducing emotional problems is not as clear. Additionally, more research is needed to test the longer-term effectiveness of these programmes. The effectiveness of online parenting programmes was also discussed, with a particular focus on Triple P online. Evidence relating to online programmes is relatively recent and suggests that online parenting programmes may be effective in reducing EBD. However, the lack of RCTs on the effectiveness of Triple P online means that it is too early to conclude that it is an effective or evidence-based intervention. However, it is one of the few online, programmes available that can be accessed without the assistance of a facilitator and therefore, is an intervention that should be examined in more detail to establish its potential benefits as a potential parenting intervention that could be implemented in an Irish context and elsewhere.

Chapter 4 Methodology

This chapter describes the methodology underpinning all of the studies on which this research is based, including the Growing up in Ireland (GUI) cohort studies (Studies One and Two) and the feasibility study. The epistemological framework which informed the research, is described first.

4.1 Epistemological and ontological approach

This research adopted a quantitative approach and therefore, was conducted within the paradigms of positivism and post-positivism (164). A paradigm informs the researcher of what is important, legitimate and reasonable (165). Positivism, post-positivism, critical theory and interpretivism are the paradigms that are mainly used within the social and health sciences (166). For the purposes of this research, positivism and post-positivism are the most relevant and are, therefore discussed below.

Positivism can be traced back to the French philosopher Auguste Comte, who believed that human beings were a phenomenon to be studied scientifically (167). Positivism is used to investigate cause and effect relationships in society (168). For positivists, there is an emphasis on methodology to replicate and quantify observations for analysis (169). Furthermore, Gratton and Jones propose that for the positivist, the researcher is independent of the subject of the research and neither affects, or is affected by, it (170). Therefore, research located in this paradigm depends on logic, the formulation and testing of hypotheses, calculations,

extrapolations and expressions to derive conclusions (170). It aims to provide explanations and to make predictions based on measurable outcomes (168). Findings are presented quantitatively and numerically using statistical approaches (170). Positivists assume that knowledge is only true if it is based on observations of external reality and that theoretical models can be developed that are generalisable. They take the empiricist view that only something which can be measured is relevant. Objects that the researcher cannot observe, manipulate and measure cannot be called truths and therefore cannot fall into the paradigm of positivism (171).

Positivism aims to arrive at a complete understanding of phenomenon by testing theories using quantitative methods (172).The positivist assumptions on research is that if carried out properly, the process will provide clear understanding of the causality of social phenomena (173). It is often predictive in nature and can be instrumental in controlling events. Thus, the first two studies presented within this thesis adopted a positivist approach in which a clear research topic was identified, appropriate hypotheses were constructed and suitable research methodologies were followed. Statistical and mathematical methods were central to these studies and the results were generalisable to the wider population.

Positivism has over time been subject to considerable criticism (171). Writers such as Locke, Mill and Durkheim challenged the traditional-positivistic belief of the absolute truth of knowledge. They argue that we cannot be positive about our claims of knowledge when studying the behaviour and actions of humans (174). This philosophical period following the traditional positivistic approach and was termed post-positivism (174). The post-positivist

paradigm is to some extent similar to positivism, specifically in regard to hypothesis testing, observation and measurement of research objects. However, it differs from positivism because it accepts that conclusions can only ever be an estimate of the truth due to unobservable influences (175). Post-positivists accept the existence of reality, but take the view that it cannot be found with the means available to us (174). Even though post-positivists use techniques similar to positivists, they accept that not everything that impacts on research can be observed, generalisable or be controlled for (171, 175).

Unlike Studies One and Two, which fall under the paradigm of positivism, Study Three was unable to follow such a stringent scientific approach and thus adopted a post-positivism approach. Post-positivism allows for more methodological freedom, while at the same time following the main principles of positivism. Positivistic researchers use large samples with the intention of generalising to the population (173). Within Study Three, the research aimed to provide a detailed methodology and analysis of a feasibility study. Therefore, the intention was not to generalise to the population per se, but rather to enable future research studies to review and learn from the methodological approach used, and to add to existing knowledge. Thus, post-positivism was the most appropriate paradigm within which to locate Study Three. The methodologies used in each of the three studies are outlined below.

4.2 Methodology for Studies One and Two: Growing Up in Ireland (GUI) - Infant and child cohort studies

Studies One and Two involved a secondary analysis of information collected as part of the GUI

study. GUI was established in 2000 under the National Children's Strategy, 'Our Children - Their Lives' (173) and has nine stated objectives which are as presented in Table 4.1.

TABLE 4-1 OBJECTIVES OF GUI

1. *To describe the lives of children in Ireland, to establish what is typical and normal as well as what is atypical and problematic.*
2. *To chart the development of children over time, examining the progress and well-being of children at critical periods from birth to adulthood.*
3. *To identify the key factors that, independently of others, most help or hinder children's development.*
4. *To establish the effects of early childhood experiences on later life.*
5. *To map dimensions of variation in children's lives.*
6. *To identify the persistent adverse effects that lead to social disadvantage and exclusion educational difficulties, ill-health and deprivation.*
7. *To obtain children's views and opinions on their lives.*
8. *To provide a bank of data on the whole child.*
9. *To provide evidence for the creation of effective and responsive policies and services for children and families (176).*

The original GUI study consisted of two cohorts - an infant and child cohort. The first wave of the infant cohort included 11,134 children born between December 2007 and June 2008, selected from The Child Benefit Register. Data from this cohort were utilised in Study One. The first wave of the child cohort included 8,568 children who were nine years old between September 2007 and June 2008, randomly selected through a process of cluster randomisation of primary schools nationally. These data forms the basis of Study Two. The approaches used to identify and analyse the data for each of the cohorts is described in this chapter, beginning with the infant cohort.

4.2.1 Study One: Design (infant cohort)

The GUI infant cohort was derived from the Irish Child Benefit Register which provides information on child benefit paid each month in respect of all children in the Republic of Ireland

under the age of 16 years (177). As it is a payments-based database, the Child Benefit Register is current and fully up-to-date (178).

The GUI infant cohort interviews were completed by 11,134 parents/guardians (this represents a response rate of 64.5%) who had a child aged nine months old between September 2008 to end-April 2009. These children were selected from a total population of 41,185 births over the period 1 December 2007 to 30 June 2008. The sample was stratified by marital status, county of residence and nationality. The GUI cohort represents just over one quarter (27 per cent) of all births in the State during the sampling period. GUI data were collected using questionnaires and interviews conducted with parents/guardians at four different time points (or waves): (1) in 2008-2009 when the children were aged nine months; (2) in 2011-2012 when the children were aged three years; (3) in 2013-2014 when the children were aged five years and (4) in 2016 when the children were nine years old. Interviews were conducted with the primary care-giver (PCG) and the resident secondary care-giver (SCG). The PCG was generally the biological mother of the 'index child' (99.7% of cases) while the SCG was most likely to be the biological father (99.6%). Therefore, the primary and secondary caregivers will be referred to henceforth as the mother and father respectively.

Each child in the study was given a unique identifier by the GUI team. It was therefore possible for the researcher (of the current study) to merge the first three waves of data together using the unique identifier and to produce a single dataset, providing a longitudinal cohort of children followed over three time points. Participants were excluded if they did not take part in all three

waves, or if they did not have a valid score on the primary outcome measure (see below). This resulted in a total sample of 8,707 cases (78% of the original cohort) (see Figure 4.1).

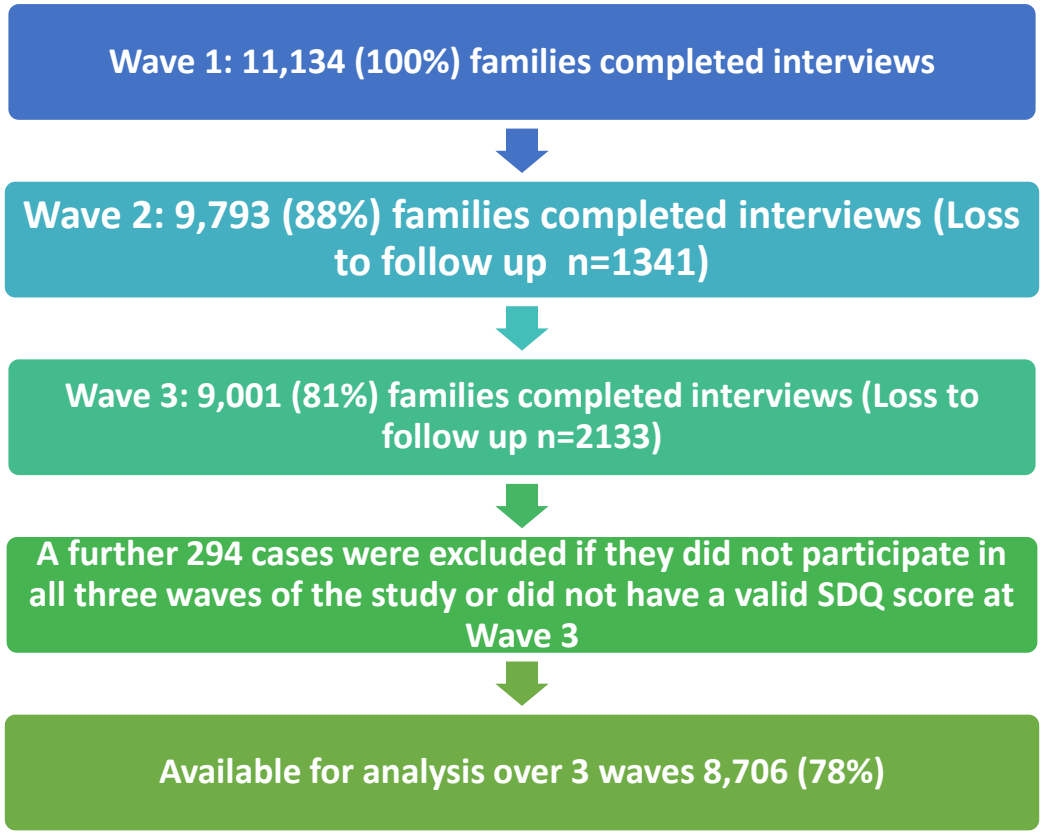

FIGURE 4-1: NUMBERS INCLUDED IN THE INFANT COHORT STUDY AND THOSE LOST TO FOLLOW UP

4.2.1.1 Primary Outcome Variable

In the current study, the primary outcome variable was emotional and behavioural difficulties (EBD) measured at Wave Three when the children were five years old. The nature and extent of EBD in the sample were measured using the *Strengths and Difficulties Questionnaire* (SDQ) (178), a 25-item behavioural screening questionnaire which incorporates five different dimensions of children's behaviour including: conduct problems, inattention hyperactivity, emotional

symptoms, peer problems, and pro-social behaviour (176). Each attribute is rated (by the PCG) using a scale from 0 to 2 (not true, somewhat true, and certainly true). Responses are summed to provide a total score for each dimension. The first four scales may be combined to yield a 'total difficulties' score. This measure is a widely used (11) and psychometrically robust tool for use by parents of children aged 3-16 (179). The recommended cut-off score for this measure is 13, above which children are considered to have EBD. This score was used in the current study to identify the existence (or not) of EBD. Although the SDQ is a reliable and validated measure, it is not a diagnostic tool and, therefore, it must be noted that no diagnostic/clinical assessment was undertaken on the children.

4.2.1.2 Covariates

The covariates considered in this study were based on a review of the literature conducted as part of this thesis, associated with EBD in early childhood. These were divided into three categories of risk relating to: (i) the child; (ii) the parents; and (iii) the family as a whole. Each of these is described below, with references provided in each case to support the choice of selected variable. The PCG reported all potential risk factors.

Childhood risk factors

Childhood risk factors were assessed using the following six variables:

(i) Gender (with female chosen as the reference category);

(ii) Gestational age (28), categorised into two groups (born before 37 or after 37 weeks);

(iii) Baby temperament, also categorised into two groups (i.e. having, or not having, a fussy/difficult temperament as a baby (180). Baby temperament was assessed using the *Infant Characteristics Questionnaire* (ICQ), which yields four sub-scale scores

which describe the child as: 'Fussy-difficult', 'Unadaptable', 'Dull' and 'Unpredictable' (177). The first of these was used in this study as it is the most widely validated score and has been shown to be associated with subsequent problem behaviour in children (178). Higher scores on this scale indicate a more difficult/fussy baby. Thus, babies who score in the top 10th percentile are categorised as being difficult/fussy;

(iv) Having/not having a chronic illness or disability (11) (any chronic illness/disability diagnosed by a doctor; such as diabetes, asthma or cerebral palsy), at the age of three or five years was also categorised into two groups (no illness/disability was used as the reference category);

(v) The presence of EBD at the age of 3 years (29) (with no EBD assigned as the reference category);

(vi) Finally, the existence of speech problems at the age of three or five years (11), the absence of which, was used as the reference category in this case (The PCG was asked if he/she had any concerns about how their child talks and makes speech sounds).

Parenting risk factors

Parenting risk factors were assessed using four variables:

(i) Parental attachment (41) which was assessed using the Quality of Attachment sub-scale from the Maternal Postnatal Attachment Scale (37). This sub-scale consisted of nine items. Mothers were asked about their feelings towards their baby and about themselves as parents, such as their patience in dealing with the baby and the

strength of their affection for him/her (178). The number of response categories varied between three and five and a total score was calculated by the GUI team. There are no established cut-off points to indicate healthy and unhealthy attachment. Therefore, in the current study, a score in the bottom 10th percentile was used to indicate unhealthy attachment, with all other scores considered as healthy attachment (reference category);

(ii) Parenting style which was examined using subscales from the Longitudinal Study of Australian Children (LASC) (181) to assess three key aspects of parenting including:

a. Warmth (displays of affection, awareness of child's needs),

b. Hostility (controlling or over-controlling parenting—negativity, use of physical discipline, rigid enforcement of rules and expectations) and

c. Consistency (the setting and consistent application of age-appropriate rules and expectations) (182).

The original subscales for GUI demonstrated medium to good reliability: alpha coefficients for warmth was $\alpha = .73$, for consistency was $\alpha = .68$ and for hostility was $\alpha = .62$. In the Growing Up in Australia (LSAC) study, this instrument was found to be a strong predictor or mediator of child outcomes (182). There are no established cut-off points to indicate normal/abnormal levels of warmth, hostility or consistency, so again, the top/bottom 10th percentile was used to indicate extreme styles of parenting, with all other scores considered 'normal' (reference category). Thus, parents who scored in the bottom 10th percentile for warmth and consistency were categorised as displaying low warmth/low consistency and those who scored above this, were categorised as

displaying normal levels of warmth/consistency. Similarly, parents who scored in the top 10th percentile for parental hostility were categorised as displaying high hostility.

Family risk factors

Family risk factors were assessed using the variables described below:

i. Mother's age at birth (11) (categorised as <25 years or 25 years and older (reference category));
ii. Smoking during pregnancy (52) with no smoking in pregnancy as the reference category;
iii. Consumption of alcohol during pregnancy (99) with no consumption as reference category;
iv. Parental use of licit or illicit drugs (101) in wave 1 or wave 2, with not consuming/misusing as the reference category.
v. Parental misuse of alcohol (38) in wave 1 or wave 2. The FAST alcohol-screening test (183) was used in this regard. Developed in the UK as a short screening tool for alcohol misuse, respondents may be classified as 'hazardous' (versus 'not hazardous') drinkers depending on whether they respond in the affirmative to the following question "How often do you have EIGHT or more drinks on one occasion?" (six drinks for women). A positive response to this question on a weekly or more frequent basis, is indicative of hazardous drinking.
vi. Whether the parents had an illness or disability (11) (any chronic illness/disability diagnosed by a doctor; such as cancer, diabetes or asthma), in wave 1 or wave 2 compared to not having an illness/disability in either wave (reference category));

vii. Level of education (11), such that the highest level of education attained was categorised into those who completed lower secondary level or less versus those who completed above this (reference category);

viii. Parental employment (16). This was categorised into three groups:

   a. Those unemployed in wave 1 and wave 2;

   b. Those unemployed in either wave 1 or wave 2;

   c. Those employed in both waves (reference group)).

ix. Mental health status which was assessed using the 8-item Centre for Epidemiological Studies in Depression scale (CES-D) (184). Scores of seven or more on this scale are considered to indicate the presence of depressive symptoms (184), while scores of below seven are classified as 'not depressed'; the latter was used here as the reference category. This screening instrument is used to measure depression in the general population, it is not a diagnostic tool that captures the presence of clinical depression. Therefore, a classification as 'depressed' should not be taken to indicate a clinical diagnosis of depression, but rather a subjective indicator of parental distress. Cronbach's alpha on this scale was high: 0.88 for mothers and 0.83 for fathers (185).

x. Parental stress which was assessed using the 'Parental Stressors' subscale of the Parental Stress Scale (186). Higher scores indicate more stress (178), such that those who scored in the top 10^{th} percentile were categorised as displaying high levels of stress with all other scores categorised as normal (reference category);

xi. Family structure (11) was categorised into single parent or two-parent (reference category) families. Annual household income (59, 60) was also categorised into two

groups - those who had low versus those who had middle to high levels of income (reference category) (see Appendix 1 for further detail).

xii. Conflict within the family (57) was assessed using the response to two questions regarding the frequency of throwing something or pushing/hitting/slapping/fighting during an argument/fight (i.e. 1=Never, 2=Not often, 3=Sometimes, 4=Often, 5=Almost always). Scores between two and five were categorised as living in a family where some degree of conflict was present (when compared to a score of one indicating the absence of any physical conflict (reference category).

4.2.1.3 Statistical Analysis

Prior to analysis, the data were re-weighted by the GUI research team according to a proportional weight to account for survey response (see Appendix 2 for more detailed information). The variables used in the re-weighting included: family structure; mother's age; principal economic status of each parent; family social class; mother's education; household tenure; geographical region; child's gender; mother's marital status; mother's nationality; and mother's residency status (178).

For study one, key variables and demographic characteristics of the sample were examined using chi-square statistics to investigate the significant risk factor associated with EBD in five year olds. Variables indicating evidence of EBD (based on the chi-square tests) were divided into the following three groups: (1) childhood risk factors; (2) parenting practices and (3) family risk factors. The relationship between these risk factors and the SDQ binary outcome variable of any

EBD when compared to none was examined using binary logistic regression for each of the three groups of variables relating to childhood risk factors, parenting practices and family risk factors.

Unadjusted and adjusted analyses were performed for each factor (within each group of variables). This was followed by an adjusted (multivariate) logistic regression model which included all relevant risk factors (within each group of variables) found to be significant at $p<0.10$ in the unadjusted analyses. Odds Ratios (ORs), 95% Confidence Intervals and statistical significance were reported for both the unadjusted and adjusted models. The variables found to be significant in the three unadjusted models were then included in the final model, which showed the overall predictors of EBD in five-year-old children. Dummy codes for missing or not applicable data were created to ensure that all 8,707 individuals were included in the multivariate logistic regression models. Analyses were conducted using SPSS Version 23 and significance at $p<0.05$ was assumed. The Bonferroni correction method was used and reported on for all analyses. This correction method is used to adjust probability (p) values when several significant tests are being performed at the same time on a single dataset, thereby reducing the chances of obtaining Type I errors (false-positive results) when multiple pairwise tests are performed on a single set of data (187). In order to perform the Bonferroni correction, the p-value under review was divided by the number of comparisons being made. The next section describes the child cohort in GUI.

4.2.2 Study Two: Design (child cohort)

The population for the GUI child cohort study was derived from data provided by the Department of Education and Science. A comprehensive listing of all primary schools (both

public and private) was generated from this data. The sampling strategy for GUI was based on a two-stage selection process in which the school was the primary sampling unit and the children within school were the secondary units (185). Of the 3,246 schools included in the sampling frame, 1,105 were randomly selected on a stratified basis. The schools were stratified by: county; gender; disadvantage status; religious denomination; and the number of nine-year-olds' enrolled. Of the 1,105 schools invited to participate in the study, 910 agreed to do so, resulting in a response rate of 82.3%. The GUI team attempted to recruit all children who were nine years old from schools with less than 40 nine-year-olds. In situations in which the school had more than 40 children of this age, the principals were then provided with a set of random numbers to select which pupils to include/exclude from the sample (187)

The GUI surveys were completed by 8,568 families who had a nine-year-old child in 2007/2008. These children were selected from a total population of 56,500, which represents just over 15 per cent of all nine-year-olds in the State during that period. GUI data were collected using questionnaires and interviews conducted with parents/guardians, teachers and children (n=8,568) at three different time points (waves) including: (1) in 2007-2008 when the children were aged nine-years-old; (2) in 2011-2012 when the children were aged 13-years-old; and (3) in 2016 when the children were aged 17/18-years-old. Interviews were conducted with the PCG and the SCG .

For Study Two it was necessary to merge waves one and two together to produce a single dataset, providing a longitudinal cohort of children followed over two time points. Wave three

was not merged or used in Study Two, as at the point of analysis, the data was not available to the researcher. Participants were excluded if they did not take part in both waves, or if they did not have a valid score on the primary outcome measure (see below). This resulted in a total sample of 7,488 cases (87% of the original cohort) (see Figure 4.2).

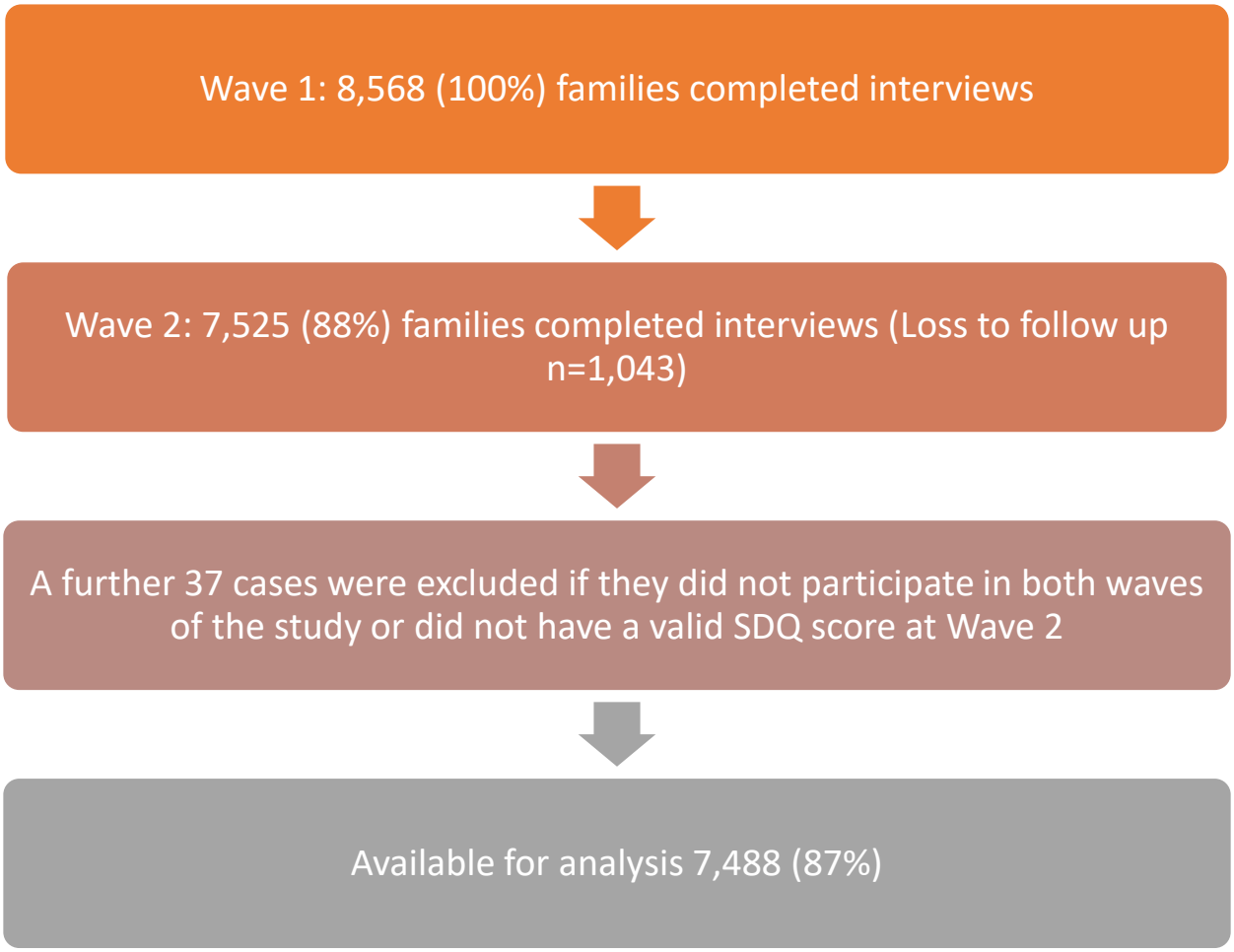

FIGURE 4-2: NUMBERS INCLUDED IN THE CHILD COHORT AND THOSE LOST TO FOLLOW UP

4.2.2.1 Primary Outcome Variable and co-variates

As in Study One, above, the primary outcome variable in the second wave of data collection (age 13 years) was EBD as measured using the SDQ (the SDQ was completed by the PCG). The choice of covariates for inclusion in the analysis - similar to the above - was based on a review of the literature relating to EBD in early adolescents which was conducted as part of the research. These covariates were divided into the same three categories of risk as in Study One, each of which is described below.

Child risk factors

Childhood risk factors were assessed using a range of variables and all responses were from the PCG's perspective unless otherwise stated and were recorded when the child was nine-years-old. These variables included the following:

i. Gender (with female chosen as the reference category); (66)
ii. Screen-time (188) which was categorised into two groups - those who watched television, played video games or used a computer for three hours or more every day, and those who took part in these activities for less than three hours per day. The latter was chosen as the reference category;
iii. The presence of EBD at nine-years-old (189) in which a SDQ score of 14 or more indicated the presence of EBD. The reference category chosen was the absence of EBD;
iv. The presence of a diagnosed specific learning difficulty (SLD) (11), in which no SLD was used as the reference category;

v. Having/not having a chronic illness or disability (any chronic illness/disability diagnosed by a doctor; such as cancer, diabetes or asthma) (102);

vi. Self-esteem which was assessed using the Piers Harris Self-Concept Scale (190). It is a 60 item scale which is completed by the child. The items are statements that express how people feel about themselves, each with a yes/no answer option. It gathers information about how children perceive themselves across the six domains of:

   a. Behavioural Adjustment (e.g. 'I am well behaved in school);
   b. Intellectual and School Status (e.g. 'I am smart');
   c. Physical Appearance and Attributes (e.g. 'I have nice hair')
   d. Freedom From Anxiety (e.g. 'I get worried when we have tests in school')
   e. Popularity (e.g. 'I am popular with boys/girls')
   f. Happiness and Satisfaction (e.g. 'I am a happy person')(190).

On all scales, higher scores indicate a higher degree of self-esteem and self-regard, whereas lower scores indicate a more negative self-concept. From totalling scores in each of these subscales an overall self-concept score can be calculated. This can range from 0 to 60.

vii. Experience of any bullying during the previous year (35). The PCG was asked if to her knowledge the child was a victim of bullying in the last year (which included physical, verbal or electronic bullying or being excluded from peers). This was categorised into two groups, children who were bullied and those who were not, with the latter used as the reference category;

viii. Child temperament; this was assessed using the *Emotionality, Activity and Sociability* temperament questionnaire (EAS). This is a 20-item questionnaire designed to measure

genetic aspects of temperament that relate to developmental differences in personality and behaviour (60). Scores are generated for each of four scales including:

a. 'Emotionality' refers to a child's emotional reaction to the world around them. A child who is highly emotional might cry easily or be more easily frightened than children who are not emotional;
b. 'Activity' refers to a child's level of energy, those who score high on this temperament would be regarded as being always on the go and very energetic;
c. 'Sociability' relates to the child's level of interaction with others. Those high in this temperament have the tendency to prefer the company of others to being alone;
d. 'Shyness' reflects a tendency to be reserved and awkward in new social situations (185).

Each scale comprises five items and respondents (PCG) are required to indicate their level of agreement to each item on a five-point scale ranging from 'not characteristic' to 'very characteristic'. Scores for each sub-scale are obtained by summing the numeric response chosen for each item. The total scores for each sub-scale range from 5 (low on that dimension) to 20 (high on that dimension) (187). There are no established cut-off points to indicate normal/abnormal levels of emotionality, activity, sociability and shyness, so the top/bottom 10th percentile was used to indicate extreme levels of temperament, with all other scores considered 'normal' (reference category). Thus, children who scored in the bottom 10^{th} percentile for sociability were categorised as not being very sociable and those who scored above this were categorised as displaying normal levels of sociability. Similarly, children who scored in the top

10th percentile for emotionality and shyness were categorised as being highly emotional and very shy.

Parenting practices/style

Positive and negative aspects of parenting were assessed from both the child and parents' perspective. This was assessed using the following variables/scales:

i. The Pianta Scale was used to assess the mother's and father's perception of their relationship with their child (191). There are 15 items in the Pianta scale which are rated on a five-point Likert scale (0-5), after which the ratings can be summed and categorised into groups of items corresponding to two subscales - conflict and closeness. There are no established cut-off points to indicate normal/abnormal levels of conflict/closeness, so the top/bottom 10th percentile was used to indicate extreme levels of conflict/lack of closeness, with all other scores considered 'normal' (reference category).

ii. Parenting style was assessed from the child's perspective using the Parenting Style Inventory – II subscales of Responsiveness and Demandingness. Each subscale comprises five questions about the parental figure's parenting style with the index child, to which the child responds on a three-point scale (Always, Sometimes or Never). The questions on the Responsiveness subscale reflect positive, warm interactions such as discussing problems, being praised and doing things together. The Demandingness subscale items relate to the setting of, and sticking to, family rules, and to discipline (187). Data gathered from both scales were used by the GUI study team to categorise parenting styles as, authoritative (warm and in control), authoritarian (very strict and controlling),

neglectful (uninvolved, neither warm or in control) or permissive (warm but not in control). For purposes of analysis, authoritative was used as the reference category and it was compared separately to each of the other styles of parenting.

Family risk factors

In the course of the survey interview with the nine-year-old's mother, she was asked if the child had experienced any stressful life events from a pre-specified list of events. She was asked to tick yes/no to each stressful event mentioned. There were 13 stressful life events listed in total, six of which have been deemed as family risk factors associated with EBD in this study. These include: death of a parent, divorce/separation of parents, serious illness/disability of family member, drug taking/alcoholism in immediate family and conflict between parents (11, 54, 121, 124, 130). For all six variables a "no" response was recorded as the reference category.

Further family risk factors included:

i. Parental depression which was assessed using the 8-item Centre for Epidemiological Studies in Depression scale (CES-D) (184). Scores of seven or more on this scale are considered to indicate the presence of depressive symptoms (184), while scores of below seven are classified as 'not depressed'; the latter was used here as the reference category;

ii. Level of education, such that the highest level of education (11) attained was categorised into those who completed lower secondary or less versus those who completed above this (reference category);

iii. Annual household income (59, 60), categorised into three groups - those who had high levels of income (reference category) versus those who had low and middle levels of income (see Appendix 1 for further detail);

iv. Finally, family structure (11) was categorised into single parent or two-parent (reference category) families.

4.2.2.2 Statistical Analysis

Prior to analysis, the data were re-weighted by the GUI research team according to a proportional weight to account for survey response (similar to that described in section 4.2.1.3 for the infant cohort). For Study Two, key variables and demographic characteristics of the sample were examined using chi-square statistics to investigate the significant risk factors associated with EBD in 13 year olds. Variables indicating evidence of EBD (based on the chi-square tests) were split into three groups; childhood risk factors, parenting practices and family risk factors. The relationship between risk factors and the SDQ binary outcome variable of any EBD compared to none, was examined using binary logistic regression for each of the three groups. Unadjusted and adjusted analyses were performed for each factor (within each group) followed by an adjusted (multivariate) logistic regression model including all relevant risk factors (within each group) found to be significant at $p<0.10$ in the unadjusted analyses. Odds Ratios (ORs), 95% Confidence Intervals and statistical significance were reported for both the unadjusted and adjusted models. The variables found to be significant in the three unadjusted models were then included in the fourth model, this model displays the overall predictors of EBD in 13-year-old children. However, as risk factors associated with EBD in adolescence differ between boys and girls (13), a final stratified logistic regression model was performed. Model

four was produced separately for boys and girls to determine if risk factors differ by gender. Dummy codes for missing or not applicable data were created to ensure that all 7,488 individuals were included in the multivariate logistic regression models. The variables found to be significant in model 4 (n=9) were used to calculate cumulative risk. Cumulative risk was constructed by dichotomising each risk factor (0 no risk; 1 risk) and then summing the dichotomous scores to provide a new variable called Totalrisks. This variable was then recoded into two categories, 0-1 risk factors (Category 1) and 2+ risk factors (Category 2). This grouping was based on previous research described in Chapter 2. Analyses were conducted using SPSS Version 23 and significance at $p<0.05$ was assumed. The Bonferroni correction method was used and reported on for all analysis.

4.2.3 Data files

Two types of data files are available from Growing Up in Ireland - the Anonymised Microdata File (AMF) and the Research Microdata File (RMF). To access the AMF, a written request outlining the proposed use of the data was sent to the Irish Social Science Data Archive (ISSDA). The AMF file contains anonymised data on the infants and children who participated in GUI; these data are publicly available. The AMF does not include sensitive supplementary questionnaires which the children and their parents are asked to complete, but which are not provided as part of the AMF.

The second type of data file available is the Research Microdata File (RMF). These files contain all information including the sensitive questionnaires mentioned above. For this research, it was

necessary to access the RMF data file for the infant and child cohorts in order to obtain sensitive information. This information included data regarding parental risk behaviours (such as drinking and smoking habits), as well as data pertaining to parental health and well-being and also data on the type of relationship parents have with their children (warm, conflicted etc.). In order to gain access to the RMF, a formal proposal was submitted to the Central Statistics Office (CSO). The proposal was then considered by the CSO and a recommendation sent to the Director General of the CSO. The proposal was successful and thus a standard user agreement was signed by the researcher who was assigned an 'Officer of Statistics' by the CSO. Prior to accessing the dataset, the researcher attended a training session which outlined the obligations and responsibilities of an Officer of Statistics. Once informed, the Economic and Social Research Institute then provided the requested data file to the researcher. The criteria set out in the standard agreement between the researcher and the CSO was adhered to at all times. (The CSO's policy on data access is provided in Appendix 3).

4.2.4 Ethical considerations

The GUI cohort studies were carried out under ethical approval granted by a dedicated and independent Research Ethics Committee (REC) convened by the Department of Children and Youth Affairs especially for the Growing Up in Ireland study (177, 185). The studies were conducted in line with the Statistics Act 1993 and the Data Protection Acts 1988 and 2003. All GUI staff involved in interviewing families for the studies were vetted by An Garda Siochana (the Police Service in Ireland) and field staff were appointed 'Officers of Statistics' which included a confidentiality and non-disclosure of information clause (178, 187).

Studies one and two involved secondary data analysis and used anonymised data only, which meant that participants could not be identified by the researcher. Under the Statistics Act, 1993, the confidentiality of data is guaranteed in law and it was under a provision of this Act that the researcher was assigned an Officer of Statistics by the Director General of the CSO. Under the Statistics Act, 1993, it is an offence to use the data for anything other than research purposes or to attempt to identify individuals. The researcher agreed in writing to these conditions and abided by all other conditions, such as those relating to data security, as set out by the CSO and the GUI Study Team. The next section describes the methodology for Study 3 of this thesis, the feasibility study.

4.3 Methodology for study 3 – Feasibility of TPOL

The final study on which this research was based, was a pilot randomised controlled trial (RCT) of the TPOL programmme. This pilot/feasibility study was conducted to test the feasibility of implementing the intervention in parents in Ireland, and the CONSORT 2010 checklist for reporting a pilot or feasibility trial was adhered to for this study (192). Ethical permission for the study was obtained from the Faculty of Health Sciences, Trinity College Dublin in August 2016 (See Appendix 4 for ethical approval letter).

4.3.1 Eligibility criteria

In order to participate in the feasibility study, a number of eligibility criteria had to be met. Eligibility criteria were: (1) having a 4-9 year- old child for whom parents had reported clinically significant levels of child emotional and behaviour problems on the SDQ (scoring in the

borderline clinical range or higher, i.e. a score of 14 or more) (see further information about the SDQ below); (2) having access to a computer and broadband internet connection (almost 90% of adults with children have internet access); and (3) resident in Ireland. The SDQ questionnaire was used to assess childrens' emotions and behaviours – this questionnaire was used to assess eligibility to participate in the study and was completed by one person (the parent/guardian) during the telephone screening interview (see Appendix 5 for screening questionnaire). Those who met the eligibility criteria were telephoned and told of this and were asked to confirm their consent, after which they were sent a copy of the consent form countersigned by the investigator. Exclusion criteria were: (1) The child had an intellectual or developmental disability (including autism); (2) the child was taking medication for, or was in regular contact with, a professional for behavioural or emotional problems; and (3) the parents were receiving treatment for psychological or relationship problems.

4.3.2 Participants and settings

Recruitment was conducted through a parenting website (see Appendix 6 for letter of permission to place advertisement on parenting website). The PR and Marketing Manager of the website acted as the gatekeeper in facilitating dissemination of information from the researcher to potential participants. An advertisement (see Appendix 7) about the study was placed on the website inviting parents who believed their child had an emotional and/or behavioural problem to participate in the study. The advertisement included an incentive to participate in the study (a €25 one-for-all gift voucher for those who completed the study).

Recruitment through the parenting website did not prove to be very successful so additional attempts to recruit participants were made by contacting the principals of five primary schools in the Dublin area (two of which were in an area characterised by high levels of socio-economic deprivation). The researcher met with the principal of the school (school 1) which her children attend and discussed the possibility of recruiting parents for the study through the school emailing list. The principal was particularly interested in taking part in the study and she also agreed to discuss the study with her colleagues/friends in other primary schools. Three of her colleagues expressed an interest in the study and thus the principal in school one passed on their contact details to the researcher (with their consent). Two more schools were recruited using a similar snowballing approach. The principals were asked to email parents to inform them about the study ((see email from principal to parents (Appendix 8) and Participant Information leaflet (Appendix 9)). The school principals acted as the gatekeepers in facilitating dissemination of information from the researcher to potential participants.

4.3.3 Intervention

TPOL is an eight-module, positive parenting programme delivered via the internet. TPOL is a variation of level four of the Triple P- Positive Parenting Programme (193). Level four positive parenting programmes are intensive parenting interventions that focus on interactions between parent and child and how positive parenting skills can be applied to a broad range of target behaviours (94). TPOL draws on five core positive parenting principles to improve the mental health outcomes of children (94). Firstly, children should be provided with a safe and engaging environment in which to grow up. Secondly, they should be provided with a positive learning

environment to stimulate problem solving and learning. Thirdly, consistent, predictable and assertive discipline should be used to help children learn to accept responsibility for their behaviour and become aware of the needs of others. Fourthly, parents should have realistic expectations and assumptions about their children's behaviour. The fifth and final principle is parental self-care so that parents find it easy to be patient, consistent and available to children (94).

The TPOL intervention provides parents with advice in the use of 17 core positive parenting strategies such as how to give praise, how to encourage quiet time and how to use the time-out concept. The content is presented in eight modules which are outlined below:

1) What is positive parenting? This module lays the foundations of Triple P's five basic principles (as mentioned above).
2) Encouraging behaviour you like. This module encourages the parent to spend more quality time with their child, talk with them, show affection and praise.
3) Teaching new skills. This module involves providing the parent with the skills to teach the child how to communicate, how to manage their feelings, how to become independent and how to solve problems
4) Managing misbehaviour. The fourth module helps the parent to manage ground rules, helps them to give clear, calm instructions and shows them how to use the quiet time and time-out strategies.
5) Dealing with disobedience. This module focuses on how to deal with a child's misbehaviour and how to encourage behaviour the parent likes.

6) Preventing problems by planning ahead. This module outlines the importance of deciding on and explaining rules to children, using rewards for good behaviour and using consequences for misbehaviour.
7) Making shopping fun. The seventh module discusses how to shop with your child, how you can make it fun by planning ahead, setting some rules and by discussing rewards and consequences with them.
8) Raising confident capable kids, is the final module in the programme. This module provides parents with the skills to show their children how to be respectful, considerate, have good social skills, have self-confidence, solve problems and become independent.

As the parent completes one module, access to the next module opens; thus the parent cannot move on to the next module without completing the previous one. One of the main features of the online programme is its ability to encourage ongoing participation in the programme without the need for personal contact with a clinician. According to the author TPOL teaches parents how to set goals, how to evaluate their goals and how to believe in their capacity to execute daily parenting tasks successfully. This is demonstrated through instructions and video demonstrations.

4.3.4 Measures

Parents were asked to provide demographic and background information on their families. Validated parent report measures were used to assess EBD in children, as well as assessing parenting skills and parental well-being. See details below.

Demographics

Demographic data were collected using the Family Background Questionnaire (78) (Appendix 10). Information collected in this questionnaire included: participants' age and gender, marital status, country of birth, education level, employment status, child's age and gender and family structure.

Primary Outcome Measure

SDQ

The primary outcome measure for change in child behaviour was the SDQ. This score was used to identify the existence (or not) of EBD depending on whether or not the score exceeded 13. See section *4.2.1.1* for further details.

Secondary Outcome Measures

I. Parenting Scale

The measure for assessing changes in ineffective parenting was the Parenting Scale (194)). This is a 30-item self-report questionnaire which measures three dysfunctional discipline styles: laxness (permissive discipline), over-reactivity (authoritarian discipline, anger, meanness and irritability) and verbosity (long reprimands or reliance on talking). Higher subscale scores indicate more dysfunctional parenting practices. Arnold *et al.* analysed the factor structure of the scale using a sample of 168 mothers who had children aged between 18 months and 4 years. The subscales demonstrated good reliability with alpha coefficients of .83 (Laxness), .82 (Overreactivity), and .63 (Verbosity) and test-retest correlations of 0.83, 0.82, and 0.79 over a two-week period, for the Laxness, Overreactivity, and Verbosity subscales, respectively. Subscale scores were

significantly correlated with global ratings on observational measures of parenting and children's behaviour in a study of 15 families (194) (Appendix 11).

II. Parent Problem Checklist (PPC)

The Parent Problem Checklist (195) (Appendix 12) is a 16-item questionnaire that assesses parental conflict over child-rearing and parental ability to agree and unite when performing parental tasks. This could include disagreements over household rules, discipline and undermining each other. For each of the 16 items, parents reported whether or not the issue was a problem in the last month. This generated a score for the Problem Scale (0 to 16) and indicated the number of areas in which the parents experienced conflict. The PPC also generated an intensity score (Extent Scale) for the problems listed which rated the extent to which the problem was an issue. The intensity score is measured on a 7-point scale ranging from 1 (not at all) to 7 (very much). The scores on the extent scale (intensity score) range from 16 to 112. Dadds and Powell (1991) report that the PPC has moderately high internal consistency ($\alpha = .70$) with a high test reliability of .90 (195).

III. Depression Anxiety Stress Scales-21 (DASS-21)

The Depression Anxiety Stress Scales-21 is a short-form of the original 42-item questionnaire (196) (Appendix 13). It assesses symptoms of depression, anxiety, and stress in adults over the preceding week. Parents indicated the extent to which each issue applied to them on a scale from 0 (Did not apply) to 3 (Applied to me very much). Higher scores indicated a greater degree of depression, anxiety or stress. To calculate comparable scores with the full DASS, each 7-item scale was multiplied by two (200). The DASS-21 has high internal consistency for the Depression, Anxiety and Stress scales ($\alpha = .82$, .90 and .93 respectively) (197).

IV. Relationship Quality Index (RQI)

The Relationship Quality Index is a 6-item index of the quality of a relationship or marriage and how satisfied an individual is within this relationship (198). The first 5 items assess the strength, stability, and satisfaction of the relationship on a 7-point scale, ranging from 'very strongly disagree' (1) to 'very strongly agree' (7). The final item assesses overall relationship happiness on a 10-point scale, ranging from 'unhappy' (1) to 'perfectly happy' (10). The measure produces a total score ranging from 6 to 45, with higher scores indicative of a more positive relationship (Appendix 14). This index has been shown to have adequate internal consistency, high reliability (α = .97) and discriminant validity (199).

V. Client Satisfaction Questionnaire

The Client Satisfaction Questionnaire (CSQ) (147) (Appendix 15) is a 13-item questionnaire that assesses: client satisfaction with the quality of the intervention; how well the programme met the parent's and child's needs; whether there was any change in parental skills and child problem behaviours; and whether the parent would recommend the programme. Parents were asked to rate the 13 statements using a seven-point likert scale ranging from very positive (7) to very negative (1). Scores in the five to seven range in the likert scale were classified as positive statements, while scores between one to three were considered negative statements, with a score of four considered as neutral. One open-ended question asked the participant to include any additional comments that they had about the programme and another open-ended question asked the participant to give reasons as to why they had not completed the entire programme (if this was the case). The scale has high internal consistency (α = .96), and item-total correlation of .66 (200).

4.3.5 Procedure

Parents who expressed an interest in the study made contact with the researcher via email. The parent(s) were then sent (via email) an information sheet (Appendix 9) and were given time to consider their participation. Parent(s) who remained interested were asked to provide their contact details, after which they were posted or emailed a consent form (Appendix 16). Those who returned the signed consent form to the researcher (the forms were returned by post or were scanned and emailed back to the researcher) were contacted by telephone and completed a 20-minute telephone 'screening' interview to inform them of the study requirements and to assess their eligibility for inclusion (See Appendix 6 for outline of this interview and questionnaires used). The SDQ was used to assess childrens' emotions and behaviours – this questionnaire was used to assess eligibility to participate in the study and was completed by one person (the parent/guardian) during the telephone screening interview. Parents were telephoned the day after the screening interview and informed of their eligibility or not for the study. Those who met the eligibility criteria were asked again to confirm their consent over the telephone, after which they were posted a copy of the consent form countersigned by the researcher. Those who did not meet the eligibility criteria were informed by telephone of this and provided with the contact information of the child mental health services in their area should they wish to follow-up.

After consent was confirmed, the parents eligible for the study were randomised to the control or intervention group. A simple randomisation technique was performed using the *Random Number* function in SPSS version 23. This involved a colleague entering all the participant

identification numbers, after which the software then allocated each participant to the control or intervention group on a 2:1 basis. This information was then passed onto the researcher. Thus, randomisation was conducted without any researcher influence. However, it was not possible to be blinded to group assignments because the researcher needed to contact the intervention group to provide log in details for the online programme and to assist with any technical problems.

Pre-intervention booklet (which included the measures mentioned above) were posted to parents in both the intervention and control groups. In this booklet, the parents were asked to provide information on the following: the number of children in their family and their age, parent educational background, and occupation, parental depression, parental style and child-rearing issues. They were provided with a stamped address envelope and asked to return the booklet to me within two weeks. Those who did not return the booklet within this period were sent a reminder email and were offered the opportunity of completing the questionnaires over the telephone with the researcher.

Parents who were assigned to the intervention condition were emailed individual log in details to the online programme and were asked to complete the online programme within 12 weeks (at which time post-assessment was conducted regardless of the number of modules completed). Participants were emailed to check they had received the log-in details. During the 12-week intervention period participants were contacted by email if they had not logged on to the programme for three weeks. A reporting tool, built into TPOL, allowed the researcher to track and record how many modules each participant completed, how long it took participants to

complete the programme and how often each participant logged on to TPOL. Participants could contact the researcher if they had any technical issues. No professional advice or guidance was given to any participant. The online intervention was offered free of charge to participants in the study. On completion of the study participants in the control group were sent their log in details for the online intervention. Data from all participants were included in the data analysis, irrespective of whether follow-up data was available according to the intention-to-treat principle.

4.3.6 Sample size

The aim was to recruit 36 parents of children aged 4-9 years (24 to the intervention group and 12 to the control group, randomised on a 2:1 ratio). This number was based on calculations by Steven Julious in 2005 who suggested that if the aim of pilot studies is purely exploratory and is to get a preliminary estimate of the difference between two groups, then a sample size of 12 per group can be justified (201). He demonstrated that for small sample sizes there is a marked gain for each increase of 1 in the sample size per group, but that the gains are less pronounced by the time the sample size has reached 12. Due to time constraints, the researcher was only able to recruit 22 parents. However, because this was a feasibility study, 22 parents was sufficient to provide preliminary information regarding the delivery and acceptability of TPOL.

4.3.7 Ethical considerations

As mentioned above ethical approval was received from the Faculty of Health Sciences Research Ethics Committee,Trinity College Dublin in August 2016 (ref no. 160604). Participants were informed that; a) their participation was voluntary and access to the online parenting

programme was free of charge; b) that their personal contact details would only be held by the researcher and no one else c) that their information would be deleted at the end of the study. The researcher ensured that the confidentiality of participant's personal data was guaranteed through specific procedures to protect their anonymity: (a) all information provided remained strictly confidential; (b) participants' names and other identifiers were not stored with any research data; (c) unique non-personally identifying ID numbers were used. Although there was a link back to the parent this was maintained in a different excel sheet kept secure and encrypted on the researcher's individual password and encrypted PC. No one else had access to this.

4.3.8 Statistical Analyses

Data were analysed using SPSS version 24. All participants who completed pre-assessment and were randomised, regardless of whether they commenced or completed the intervention, were included in the analysis. Calculations for missing data for the post-intervention measures were conducted using the last-observation-carried-forward method. The remaining data that were missing were coded and reported as such in the analysis. Baseline characteristics for all parents were analysed and checked for differences (if any) between the intervention and wait-list control conditions for all variables studied (see list in Table 1 below). Chi-square tests (for categorical variables) and Analysis of Covariance (ANCOVA) (for continuous variables) were carried out to check for adequate randomisation and to confirm that there was no statistically significant differences between the control and intervention groups in terms of their demographics and their pre-assessment scores. Levene's test and normality checks were carried out to ensure that the ANCOVA assumptions were met. To evaluate short-term

intervention effects, differences between the intervention and control groups were examined using a series of ANCOVAs, with post-intervention scores as dependent variables and pre-assessment data included as covariates. Cohen's d effect sizes were reported (small effect = 0.2, medium effect = 0.5, large effect = 0.8) (202). Significance at $p<.05$ was assumed. The Bonferroni correction method was used and reported on for all analyses.

TABLE 4-2 LIST OF ALL VARIABLES ANALYSED IN THE FEASIBILITY STUDY

Demographic Variables	Outcome Variables
Child gender	Client Satisfaction Questionnaire
Participant gender	Strengths and Difficulties Questionnaire
Family structure	Parenting Scale
Marital status	Depression and Anxiety Scale
Ethnic group	Parent Problem Checklist
Education level	Relationship Quality Index
Employment status	
Child age	
Respondents age	
No. of children at home	

4.4 Conclusion

In summary, this chapter presented the epistemological and methodological information associated with each of the three studies undertaken as part of this thesis. The next three chapters present the findings from each study.

Chapter 5 Results Study 1: Growing up in Ireland: The five-year-old cohort

Study 1 used GUI data to identify the prevalence of EBD in Irish children and establish whether risk factors identifiable in infancy (nine months) and early childhood (three years) can predict emotional and behavioural outcomes in five-year-old children. The results of this study are outlined below. The work has been submitted for publication in the Journal of Mental Health and is under review (See Appendix 17).

5.1 Baseline data

Child and parental characteristics of the baseline cohort, the five year follow-up cohort, and those lost to follow-up at five years are shown in Table 5.1. The results for the baseline and follow-up cohorts indicate that parental participants were typically aged 35-44 years, living in two-parent households and educated to upper secondary level or above. Marginally more of the child participants were male. The children in the lost to follow-up cohort were significantly ($p<0.05$) more likely to live in a single parent household, have mothers who were younger and who left school early compared to those with completed follow-up. However, these potential sources of bias were addressed during the re-weighting phase of the analysis to minimise impact on the overall results (see chapter 4, section 4.2.1.3 for methods used in the re-weighting phase).

TABLE 5-1: CHARACTERISTICS OF BASELINE, FOLLOW-UP AND LOST TO FOLLOW-UP POPULATIONS (UNWEIGHTED).

	Baseline (Total n=11,133,100%)	Follow-up (n=8,706, 78%)	Lost to follow up (n=2,427, 22%)
	N (%)	N (%)	N (%)
Gender of study child			
Male	5678 (51.0)	4409 (50.6)	1269 (52.3)
Female	5455 (49.0)	4297 (49.4)	1158 (47.7)
Maternal age			
16-24 years	1273 (11.4)	818 (9.4)	455 (18.7)
25-34 years	6187 (55.6)	4831 (55.5)	1356 (55.8)
35-44 years	3673 (33.0)	3057 (35.1)	616 (25.4)
Education level (Mother)			
Lower secondary or less	1306 (11.7)	894 (10.3)	412 (17.0)
Upper secondary to lower third	5787 (52.0)	4526 (52.0)	1261 (52.0)
Upper third	4031 (36.2)	3283 (37.7)	748 (30.8)
Missing data	9 (0.1)	3(0.0)	6 (0.2)
Family structure			
Single parent household	1359 (12.2)	889 (10.2)	470 (19.4)
Two parent household	9774 (87.8)	7817 (89.8)	1957 (80.6)

5.2 Prevalence of EBD and associated risk factors in five-year-olds

The analysis of GUI included data on 8,706 children and their parents. The overall prevalence of EBD among five-year-old children in Ireland, according to parental report, was 11.5% (n=997) (95% CI 10.8%-12.1%). Boys (n=610, 13.7%) (95% CI 12.7%-14.7%) were significantly more likely to have EBD than girls (n=387, 9%) (95% CI 8.3%-10.0%) (Table 5.2).

5.2.1 Individual childhood risk factors associated with EBD

Table 5.2 displays the early childhood risk factors associated with EBD in five-year-old children. All six childhood risk factors remained significant after Bonferroni's correction was applied (in

order to perform the Bonferroni correction, the p-value under review was divided by the number of risk factors examined). They included:

- Having an EBD at three years: Almost 40% (n=424) of children with EBD at three years had an EBD at five years.
- Temperament: Twenty-two percent (n=175) of children who were fussy or difficult babies had EBD when they were five-years-old, in comparison to only 10% (n=818) of children who had a normal temperament.
- Speech and language difficulties: Eighteen percent (N=422) of children who had speech and language difficulty at the age of three or five years had EBD when they were five-years- old, in comparison to only 9% (N=569) of children with no speech and language difficulty at this age.
- Chronic illness or disability: Eighteen percent (n=396) of children who had a chronic illness or disability at three or five years had EBD at the age of five in comparison to 9% (n=599) of children with no illness or disability.
- Gestation: Seventeen percent (n=94) of children who were born prematurely had EBD at five years, compared to just over 10% (n=901) of children who were born at term.

TABLE 5-2: EARLY CHILDHOOD RISK FACTORS ASSOCIATED WITH EBD IN FIVE-YEAR-OLD CHILDREN (WEIGHTED) (N=8,706)

Early childhood risk factors	No EBD n=7,709 (88.5%)		EBD n=997 (11.5%)		χ2	p Value $
Gender of child						
Male	3852	86.3%	610	13.7%	44.5	<0.001***
Female	3857	90.9%	387	9.1%		
Gestation						
Born at term	7253	89.0%	901	11.0%	19.4	<0.001***
Born premature	451	82.8%	94	17.2%		
No data available	5	71.4%	2	28.6%		
Temperament as baby						
Normal temperament	7063	89.6%	818	10.4%	95.4	<0.001***
Fussy baby	623	78.1%	175	21.9%		
No data available	23	85.2%	4	14.8%		
Chronic illness or disability at three years or five years						
No illness or disability in W2 or W3	5958	90.9%	599	9.1%	139.2	<0.001***
Prolonged illness or disability in W2 or W3	1747	81.5%	396	18.5%		
No data available	4	66.7%	2	33.3%		
Speech and language difficulties						
No speech and language difficulties at three or five years	5758	91.0%	569	9.0%	137.2	<0.001***
Speech and language difficulties at three or five years	1922	82.0%	422	18.0%		
No data available	29	82.9%	6	17.1%		
EBD at three-years-old						
Normal behaviour	7050	92.5%	573	7.5%	940.8	<0.001***
Borderline/ abnormal behaviour	654	60.7%	424	39.3%		
No data available	5	100.0%	0	0.0%		

$ χ2 =Pearson's chi-square applied
Variables significant at *** p<0.001, ** p<0.01, * p<0.05
No data refers to missing data or data not available due to the father not being involved in child's life.

5.2.2 The association between parenting practices and EBD

Table 5.3 illustrates the association between parenting practices and EBD in early childhood. It focuses on parenting practices, such as the quality of the parent-child relationship and parenting

styles in early childhood and how they are associated with children's EBD at five years. Only one of the seven parenting practices was not significantly associated with EBD in five-year-old children after Bonferroni's correction was applied – there was no significant relationship between paternal warmth and EBD. The parenting practices that were associated with EBD in early childhood included:

- Hostile or harsh (maternal) parenting practices: Over one quarter of children (n=272, 28%) who had a mother who displayed harsh parenting practices (such as hitting, yelling or threatening their child) when they were three-years-old, had EBD in early childhood, compared to less than 10% of children whose mothers did not display harsh discipline (n=725, 9%).
- Inconsistent (maternal) parenting practices: Twenty-six percent (n=196) of children whose mother displayed inconsistent parenting practices (for example not communicating clear rules to their children and being inconsistent in applying these rules) had EBD at five years, in comparison to just 10% (n=799) of children who had parents who displayed consistent parenting practices.
- Maternal attachment: Almost one in five babies (n=168) who had a mother who reported insecure attachment, for example not bonding or being close to their baby, went on to develop EBD in early childhood. This compares to only one in ten babies (n=791) who had a close relationship with their mother.
- Inconsistent (paternal) parenting practices: Almost 20% (n=112) of children with EBD had a father who displayed inconsistent parenting practices, in comparison to just 12% (n=723) of children with no EBD.

TABLE 5-3: ASSOCIATION BETWEEN PARENTING PRACTICES AND EBD IN FIVE-YEAR-OLD CHILDREN (N=8,706)

Parenting practices	No EBD n=7,709 (88.5%)		EBD n=997 (11.5%)		χ2	p Value $
Maternal attachment when child was nine- months-old						
Secure attachment	6804	89.6%	791	10.4%	58.5	<0.001***
Insecure attachment	715	81.0%	168	19.0%		
No data available	190	83.3%	38	16.7%		
Maternal parenting style-Warmth when child was three-years-old						
Displays normal levels of warmth	7068	88.9%	880	11.1%	13.1	<0.001***
Displays low levels of warmth	640	84.5%	117	15.5%		
No data available	1	100.0%	0	0.0%		
Maternal parenting style-Hostility when child was three-years-old						
Displays low levels of hostility	7017	90.6%	725	9.4%	306.1	<0.001***
Displays high levels of hostility	683	71.5%	272	28.5%		
No data available	9	100.0%	0	0.0%		
Maternal parenting -Consistency when child was three-years-old						
Consistent parenting	7136	89.9%	799	10.1%	168.1	<0.001***
Inconsistent parenting	566	74.3%	196	25.7%		
No data available	7	77.8%	2	22.2%		
Paternal parenting style-Warmth when child was three-years-old						
Displays normal levels of warmth	5538	90.8%	561	9.2%	0	0.886
Displays low levels of warmth	473	90.6%	49	9.4%		
No data available	1698	81.4%	387	18.6%		
Paternal parenting style-Hostility when child was three-years-old						
Displays low levels of hostility	5157	91.6%	472	8.4%	40.1	<0.001***
Displays high levels of hostility	507	83.8%	98	16.2%		
No data available	2045	82.7%	427	17.3%		
Paternal parenting style-Consistency when child was three-years-old						
Consistent parenting	5286	91.4%	499	8.6%	20.0	<0.001***
Inconsistent parenting	723	86.6%	112	13.4%		
No data available	1700	81.5%	386	18.5%		

$ χ2 =Pearson's chi-square used, Variables significant at *** p<0.001, ** p<0.01, * p<0.05

No data refers to missing data or data not available due to the father not being involved in child's life.

5.2.3 The association between family risk factors and EBD

The association between family risk factors in earlier childhood and EBD in 13-year-old children was examined next. Sixteen of the 19 family risk factors studied were significantly associated with EBD in five-year-old children after Bonferroni's correction was applied, some of which are included below (Table 5.4):

- Parental stress: Almost 30% percent (n=277) of children whose mother reported high levels of stress went on to have EBD at five-years, in contrast, less than 10% (n=707) of children whose mothers were not stressed had EBD at this age. A similar pattern is evident in fathers.
- Maternal age at child's birth: Almost one quarter (n=228) of children born to mothers who were under 25-years-old had EBD at five years, in comparison to just 10% of children born to older mothers.
- Family structure: Over 20% of children from a single parent family (n=282, 22.7%) had EBD at five years, while less than one in ten children from a two parent family had EBD at this age (n=716, 9.6%).
- Maternal depression: Over 20% of children who had a mother who suffered from depression when they were nine-months or three-years-old had EBD at five (n=312, 21.4%), compared to less than 10% of children whose mother did not suffer from depression during this period (n=648, 9.4%).
- Marital conflict: Fifteen percent of children who experienced parental conflict when they were nine months or three-years-old had EBD at five years (n=109, 15.5%), in comparison to only 8% (n=484) of children who did not experience such conflict at this age.

- Chronic illness/disability (maternal): Seventeen percent (n=291) of children whose mother had a chronic illness or disability when they were nine-months or three-years-old had EBD at five years, while just 10% (n=688) of children whose mothers were healthy had EBD at this age.
- Education level (maternal): Almost one in five children whose mother left school before finishing secondary level had EBD when they were five-years-old (n=277, 18.1%), in comparison to just over 10% of children whose mothers completed at least secondary level (n=720, 10.1%).

TABLE 5-4: FAMILY RISK FACTORS ASSOCIATED WITH EBD IN FIVE-YEAR-OLD CHILDREN (N=8,706)

	No EBD n=7,709 (88.5%)		EBD n=997 (11.5%)		χ2	p Value $
Maternal age at child's birth						
25 years or over	6944	90.0%	769	10.0%	146 .4	<0.001***
Under 25 years	765	77.0%	228	23.0%		
Smoke during pregnancy						
No	6186	90.2%	674	9.8%	81.3	<0.001***
Yes	1286	82.2%	279	17.8%		
No data available	237	84.3%	44	15.7%		
Maternal alcohol use during pregnancy						
No alcohol use during pregnancy	69	92.0%	6	8.0%	1	0.443
Alcohol use during pregnancy	1471	89.2%	178	10.8%		
No data available	6169	88.3%	813	11.7%		
Mother misused illicit drugs when child was nine months or three-years-old						
No illicit drug use	7388	88.8%	931	11.2%	16.8	<0.001***
Illicit drug use	164	79.6%	42	20.4%		
No data available	157	86.3%	24	13.7%		
Maternal parenting stress levels when child was three-years-old						
Low stress levels	6872	90.7%	707	9.3%	299.1	<0.001***
High stress levels	714	72.0%	277	28.0%		
No data available	123	90.4%	13	9.6%		
Mother suffered from depression when child was nine months or three-years-old						
No depression	6273	90.6%	648	9.4%	171.4	<0.001***
Suffered from depression	1148	78.6%	312	21.4%		
No data available	288	88.3%	37	11.3%		
Maternal alcohol use when child was nine months or three-years-old						
No misuse of alcohol	5471	89.5%	641	10.5%	16	<0.001***
Misused alcohol	615	84.6%	112	15.4%		
No data available	1623	86.9%	244	13.1%		
Mother had a chronic illness or disability when child was nine months or three-years-old						
Had no illness or disability	6183	90.0%	688	10.0%	66.9	<0.001***
Had a chronic illness or disability	1416	83.0%	291	17.0%		
No data available	110	86.6%	18	14.2%		

χ2 =Pearson's chi-square

Variables significant at *** p<0.001, ** p<0.01, * p<0.05

No data refers to missing data or data not available due to the father not being involved in child's life.

TABLE 5.4: FAMILY RISK FACTORS (CONTINUED) ASSOCIATED WITH EBD IN FIVE-YEAR-OLD CHILDREN (N=8,706)

	No EBD n=7,709 (88.5%)		EBD n=997 (11.5%)		χ2	p Value $
Mother's employment status when child was nine months or three-years-old						
In employment when child was nine months and three-years-old	2521	85.0%	444	15.0%	82.3	<0.001***
In employment when child was nine months or three-years-old	1434	87.2%	210	12.8%		
Unemployed when child was nine months and three-years-old	3562	91.9%	314	8.1%		
Missing	192	86.8%	29	13.2%		
Mother's education level						
Upper secondary and above	6454	90.0%	720	10.1%	81.2	<0.001***
Lower secondary or less	1250	81.9%	277	18.1%		
No data available	5	100.0%	0	0.0%		
Father suffered from depression when child was nine months or three-years-old						
No depression	5008	91.4%	474	8.6%	6.1	0.013
Suffered from depression	316	87.8%	45	12.5%		
No data available	2385	83.3%	479	16.7%		
Paternal alcohol use when child was nine months or three-years-old						
No misuse of alcohol	3706	92.0%	323	8.0%	9.2	0.002**
Misused alcohol	1109	89.2%	134	10.8%		
No data available	2893	84.2%	541	15.8%		
Father misused illicit drugs when child was nine months or three-years-old						
No illicit drug use	5069	91.1%	497	8.9%	4	0.046±
Illicit drug use	424	88.5%	56	11.7%		
No data available	2216	83.3%	445	16.7%		
Father had a chronic illness or disability when child was nine months or three-years-old						
Had no illness or disability	4827	91.2%	466	8.8%	0.1	0.813
Had a chronic illness or disability	621	90.9%	62	9.1%		
No data available	2261	82.9%	469	17.2%		
Father's employment status when child was nine months or three-years-old						
In employment in both waves	4503	91.9%	399	8.1%	23.9	<0.001***
In employment in one wave	633	86.4%	100	13.6%		
Not in employment in W1 or W2	301	90.9%	30	9.1%		
No data available	2272	82.9%	468	17.1%		

χ2 =Pearson's chi-square, Variables significant at *** p<0.001, ** p<0.01, * p<0.05

± After Bonferroni's correction was applied variable was no longer significant

No data refers to missing data or data not available due to the father not being involved in child's life.

TABLE 5.4: FAMILY RISK FACTORS (CONTINUED) ASSOCIATED WITH EBD IN FIVE-YEAR-OLD CHILDREN (N=8,706)

	No EBD n=7,709 (88.5%)		EBD n=997 (11.5%)		χ2	p Value $
Father's stress levels when child was three-years-old						
Low stress levels	5246	91.8%	470	8.2%	59.7	<0.001***
High stress levels	664	83.2%	133	16.7%		
No data available	1798	82.0%	394	18.0%		
Family structure						
Single parent household	963	77.3%	282	22.7%	179.2	<0.001***
Two parent household	6746	90.4%	716	9.6%		
Parental conflict when child was nine months or three-years-old						
No conflict when child was nine months or three-years-old	5395	91.8%	484	8.2%	40.88	<0.001***
Conflict between parents when child was nine months or three-years-old	592	84.5%	109	15.5%		
No data available	1722	81.0%	404	19.0%		
Family income						
Middle/High	4507	91.1%	438	8.9%	88.13	<0.001***
Low	2773	84.4%	513	15.6%		
No data available	429	90.3%	46	9.7%		

χ2 =Pearson's chi-square, Variables significant at *** p<0.001, ** p<0.01, * p<0.05
No data refers to missing data or data not available due to the father not being involved in child's life.

5.3 Risk factors and EBD in five-year-old children assessed using logistic regression models

For purposes of the next stage of analysis, logistic regression was used to predict EBD in five-year-old children. Variables associated with EBD - based on the results shown above - were divided into three groups including: 'individual risk factors' (Model 1), 'parenting practices' (Model 2), and 'family risk factors' (Model 3). Unadjusted analyses were performed for each factor within each model. This was followed by a multivariate logistic regression model ('Adjusted Model') which included all variables found to be significant in the unadjusted model.

Finally, all variables found to be significant in the 3 unadjusted models were then included in Model 4, which shows the overall predictors of EBD in five-year-olds.

5.3.1 Early childhood risk factors as predictors of EBD

Table 5.5 presents the unadjusted and adjusted Odds ratios (and 95% Cis) from logistic regression models of the childhood risk factors predicting EBD in five-year-old children. As shown, all of the individual risk factor variables were significantly associated with EBD after Bonferroni's correction was applied. In the adjusted model, the odds ratios ranged from 1.31 to 6.68. The most statistically significant predictor in the adjusted model was having EBD at the age of three years. The odds of having EBD at five years is almost seven times greater for children who had EBD at three-years compared to children who did not have EBD at this age.

5.3.2 Parenting practices as predictors of EBD

Table 5.6 presents the unadjusted and adjusted logistic regression models for the variables associated with parenting practices and how they predicted EBD in five-year-old children. Paternal warmth has not been included in the models as there was no significant association previously found (Table 5.3). The remaining six variables were all significant in the unadjusted model. However, in the adjusted model, only four remained significant predictors of EBD after Bonferroni's correction was applied. The odds ratios for these variables ranged from 1.54 to 3.13. The most significant predictor in the adjusted model was the mother reporting high levels of hostility when the child was three-years-old. The odds of having EBD at five years is more than three times higher for children whose mother reported high levels of hostility compared to children whose mothers did not.

TABLE 5-5: MODEL 1: UNADJUSTED AND ADJUSTED ORS (95% CI) OF CHILDHOOD PREDICTORS OF EBD IN FIVE-YEAR-OLDS

Child risk factors *(reference category)*	Unadjusted Model	Adjusted Model
Gender		
Male	1.58 (1.38-180) ***	1.31 (1.13-1.52)***
Female		
Gestation		
Born before 37 weeks	1.67 (1.33-2.11) ***	1.50 (1.16-1.94)**
Born at term		
Baby temperament		
Difficult temperament	2.43 (2.03-2.92) **	1.80 (1.47-2.20)***
Easy temperament		
Childhood illness/disability at three years or five years		
Had a long term illness or disability	2.26 (1.97-2.59) ***	1.79 (1.54-2.08)***
Did not have a long term illness or disability		
Speech and language difficulty at three years or five years		
Had a speech and language difficulty	2.22 (1.94-2.54) ***	1.64 (1.41-1.90)***
Did not have a speech and language difficulty		
EBD at three-years-old		
Had EBD	7.96 (6.86-9.24) ***	6.68 (5.73-7.80) ***
Did not have EBD		

Adjusted model is for all predictors identified as significant in the unadjusted models.
Variables significant at *** p<0.001, ** p<0.01, * p<0.05.

TABLE 5-6: MODEL 2: UNADJUSTED AND ADJUSTED ORS (95% CI) OF PARENTING (PARENTING PRACTICES) PREDICTORS OF EBD IN FIVE-YEAR-OLDS

Parenting practices *(reference category)*	Unadjusted Model	Adjusted Model
Maternal attachment with child (at nine-months)		
Mother reported insecure attachment with child	2.03 (1.69-2.43)***	1.77 (1.46-2.15)**
Mother reported secure attachment with child		
Maternal parenting style - warmth (at three-years)		
Mother reported not having a warm relationship with child	1.47 (1.19-1.81) ***	1.14 (0.91-1.43)
Mother reported having a warm relationship with child		
Maternal parenting style - hostile (at three-years)		
Mother reported using harsh discipline	3.85 (3.28-4.5) ***	3.13 (2.63-3.73)***
Mother reported not using harsh discipline		
Maternal parenting style - inconsistency (at three-years)		
Mother reported inconsistent parenting practices	3.09 (2.59-3.70) ***	2.37 (1.96-2.88)***
Mother reported consistent parenting practices		
Paternal parenting style - hostile (at three-years)		
Father reported using harsh discipline	2.12 (1.67-2.68) ***	1.54 (1.19-1.98)**
Father reported not using harsh discipline		
Paternal parenting style - inconsistency (at three-years)		
Father reported inconsistent parenting practices	1.64 (1.32-2.05) ***	1.26 (0.99-1.60)
Father reported consistent parenting practices		

Adjusted model is for all predictors identified as significant in the unadjusted models
Variables significant at *** p<0.001, ** p<0.01, * p<0.05

5.3.3 Family risk factors as predictors of EBD

Table 5.7 presents the unadjusted and adjusted ORs (and 95% Cis) from logistic regression models for the association between family risk factors and EBD in five-year-old children. Two of the family risk factors shown in Table 5.4 were excluded from the models, as they were not found to be significant in univariate analyses. These included maternal alcohol consumption during pregnancy and paternal illness or disability. The remaining 17 variables were all significant in the unadjusted model. In the adjusted model, nine remained significant predictors of EBD

after Bonferroni's correction was applied. The odds ratios for these variables ranged from 1.06 to 3.00. The most significant predictor in the adjusted model was the mother reporting high levels of stress when the child was three-years-old. The odds of having EBD at five years is three times higher for children whose mother reported high levels of stress than for children whose mothers did not.

TABLE 5-7: MODEL 3: UNADJUSTED AND ADJUSTED ORS (95% CI) OF FAMILY PREDICTORS OF EBD IN FIVE-YEAR-OLDS

Family risk factors *(reference category)*	Unadjusted Model	Adjusted Model
Maternal stress levels when child was three-years-old		
Mother reported high stress levels	3.78 (3.22-4.43) ***	3.00 (2.52-3.56)***
Mother reported normal stress levels		
Mothers age at child's birth		
Mother under 25 years	2.70 (2.29-3.18) ***	1.55 (1.27-1.89)***
Mother 25 years or over		
Smoked in pregnancy		
Mother smoked during pregnancy	1.99 (1.71-2.32) ***	1.04 (0.85-1.28)
Mother did not smoke during pregnancy		
Maternal alcohol use when child was nine months or when child was three years		
Misuse of alcohol	1.55 (1.25-1.93) ***	0.99 (0.78-1.26)
None to normal alcohol use		
Maternal illicit drug use when child was nine months or when child was three years		
Drug use	2.02 (1.43-2.86)***	1.06 (0.69-1.63)
No drug use		
Maternal depression when child was nine months or three-years-old		
Maternal depression	2.63 (2.27-3.06) ***	1.53(1.30-1.81)***
No maternal depression		
Maternal illness/disability when child was nine months or three-years-old		
Maternal illness	1.85 (1.59-2.15) ***	1.49 (1.27-1.75)***
No maternal illness		

Adjusted model is for all predictors identified as significant in the unadjusted models.
Variables significant at *** p<0.001, ** p<0.01, * p<0.05.
± After Bonferroni's correction was applied variable was no longer significant

TABLE 5.7: MODEL 3: UNADJUSTED AND ADJUSTED ORS (95% CI) OF FAMILY PREDICTORS OF EBD IN FIVE-YEAR-OLDS (CONTINUED)

Family risk factors *(reference category)*	Unadjusted Model	Adjusted Model
Maternal employment when child was nine months or three-years-old		
Mother was unemployed intermittently when child was nine months or three years	1.68 (1.39-2.01) ***	0.93 (0.77-1.12)
Mother was continuously unemployed when child was nine months and three-years-old	2.00 (1.71-2.34) ***	0.75 (0.63-1.10)
Mother was employed when child was nine months and three-years-old		
Maternal education level		
Lower secondary or less	1.98 (1.70-2.31) ***	1.32(1.11-1.58)±
Completed upper secondary or more)		
Paternal depression when child was nine months or 3 years old		
Paternal depression	1.50 (1.08-2.07)*	0.95(0.67-1.35)
No paternal depression		
Paternal alcohol use when child was nine months or three-years-old		
Misuse of alcohol	1.38 (1.12-1.71) **	1.32(1.06-1.66)±
None to normal alcohol use		
Paternal illicit drug use when child was nine months or when child was three years		
Drug use	1.34 (1.00-1.80) *	0.88(0.63-1.25)
No drug use		
Paternal employment when child was nine months or three-years-old		
Father was unemployed intermittently when child was nine months or three years	1.88 (1.4-2.26) ***	1.45 (1.12-1.88)±
Father was continuously unemployed when child was nine months and three-years-old	1.15 (0.77-1.68)	-
Father was employed when child was nine months and three-years-old		

Adjusted model is for all predictors identified as significant in the unadjusted models
Variables significant at *** p<0.001, ** p<0.01, * p<0.05
± After Bonferroni's correction was applied variable was no longer significant

TABLE 5.7: MODEL 3: UNADJUSTED AND ADJUSTED ORS (95% CI) OF FAMILY PREDICTORS OF EBD IN FIVE-YEAR-OLDS (CONTINUED)

Family risk factors *(reference category)*	Unadjusted Model	Adjusted Model
Paternal stress levels when child was three years		
Father reported high stress levels	2.24 (1.82-2.76) ***	1.82 (1.45-2.28)***
Father reported normal stress levels		
Parental conflict when child was nine months or three years		
Parental conflict	2.07 (1.66-2.58) ***	1.5 (1.18-1.90) **
No parental conflict		
Family structure when child was three-years-old		
Single parent household	2.76 (2.37-3.22) ***	1.03 (0.74-1.43)
Two parent household		
Household income when child was three-years-old		
Low income	1.90 (1.66-2.18) ***	1.08 (0.90-1.28)
Mid to high income		

Adjusted model is for all predictors identified as significant in the unadjusted models.
Variables significant at *** p<0.001, ** p<0.01, * p<0.05.
± After Bonferroni's correction was applied variable was no longer significant

5.3.4 Overall predictors of EBD

All variables found to be significant in the unadjusted models were then included in model four. Table 5.8 presents the adjusted logistic regression model for these variables. The odds ratios for the significant variables in this final model ranged from 1.24 to 3.88. All of the child risk factors discussed in Table 5.5 remain significant apart from Gestation. For parenting practices, inconsistent maternal parenting, maternal attachment, as well as maternal hostility/harshness remained significant. Of the seventeen family risk factors examined in the final model, only three remained significant; these included maternal stress, maternal illness and parental conflict. Overall the three most significant predictors of EBD in five-year-old children were:

- Having EBD at the age of three years 3.88 (CI=3.27-4.62).
- Having a mother who reported high levels of hostility when the child was three-years-old OR= 2.05 (CI= 1.68-2.49).
- Having a mother who reported high levels of stress when the child was three-years-old OR=1.94 (CI=1.59-2.35).

See figure 5.1 below for the overall predictors of EBD based on model 4.

FIGURE 5-1: OVERALL PREDICTORS OF EBD IN FIVE-YEAR-OLD CHILDREN

TABLE 5-8: MODEL 4: OVERALL PREDICTORS OF EBD IN FIVE-YEAR-OLDS FROM LOGISTIC REGRESSION (OR AND 95% CIS)

All risk factors *(reference category)*	Adjusted Odds Ratios and 95% CIs
Child risk factors *(reference category)*	
Gender	
Male	1.41 (1.21-1.65)***
Female	
Gestation	
Born before 37 weeks	1.46 (1.12-1.92)±
Born at term	
Baby temperament	
Difficult temperament	1.37 (1.10-1.72)***
Easy temperament	
Childhood illness/disability at three years or five years	
Had a long term illness or disability	1.68 (1.43-1.97)***
Did not have a long term illness or disability	
Speech and language difficulty at three years or five years	
Had a speech and language difficulty	1.61 (1.38-1.89)***
Did not have a speech and language difficulty	
EBD at three-years-old	
Had EBD	3.88 (3.27-4.62) ***
Did not have EBD	
Parenting practices	
Maternal attachment with child (at nine-months)	
Mother reported insecure attachment with child	1.35 (1.12-1.68)***
Mother reported secure attachment with child	
Maternal parenting style - warmth (at three-years)	
Mother reported not having a warm relationship with child	0.97 (0.75-1.24)
Mother reported having a warm relationship with child	
Maternal parenting style - hostile (at three-years)	
Mother reported using harsh discipline	2.05 (1.68-2.49)***
Mother reported not using harsh discipline	
Maternal parenting style - inconsistency (at three-years)	
Mother reported inconsistent parenting practices	1.74 (1.40-2.15)***
Mother reported consistent parenting practices	

TABLE 5.8: MODEL 4: OVERALL PREDICTORS OF EBD IN FIVE-YEAR-OLDS FROM LOGISTIC REGRESSION (OR AND 95% CIS) (CONTINUED)

All risk factors *(reference category)*	Adjusted Odds Ratios and 95% CIs
Paternal parenting style - hostile (at three-years)	
Father reported using harsh discipline	1.18 (0.89-1.58)
Father reported not using harsh discipline	
Paternal parenting style - inconsistency (at three-years)	
Father reported inconsistent parenting practices	1.12 (0.87-1.45)
Father reported consistent parenting practices	
Family risk factors	
Maternal stress levels when child was three-years-old	
Mother reported high stress levels	1.94 (1.59-2.35)***
Mother reported normal stress levels	
Mothers age at child's birth	
Mother under 25 years	1.32 (1.02-1.58) ±
Mother 25 years or over	
Smoked in pregnancy	
Mother smoked during pregnancy	1.02 (0.81-1.28)
Mother did not smoke during pregnancy	
Maternal alcohol use when child was nine months or when child was three years	
Misuse of alcohol	0.92 (0.71-1.19)
None to normal alcohol use	
Maternal illicit drug use when child was nine months or when child was three years	
Drug use	1.08 (0.70-1.65)
No drug use	
Maternal depression when child was nine months or three-years-old	
Maternal depression	1.15 (0.96-1.38)
No maternal depression	
Maternal illness/disability when child was nine months or three-years-old	
Maternal illness	1.37(1.15-1.64)***
No maternal illness	

TABLE 5.8: MODEL 4: OVERALL PREDICTORS OF EBD IN FIVE-YEAR-OLDS FROM LOGISTIC REGRESSION (CONTINUED)

Maternal employment when child was nine months or three-years-old	OR and (95% CIs)
Mother was unemployed intermittently when child was nine months or three years	1.20 (0.97-1.48)
Mother was continuously unemployed when child was nine months and three-years-old	1.21 (1.00-1.47)
Mother was employed when child was nine months and three-years-old	
Maternal education level	
Lower secondary or less	1.24 (1.01-1.50)±
Completed upper secondary or more	
Paternal depression when child was nine months or 3 years old	
Paternal depression	0.89 (0.60-1.30)
No paternal depression	
Paternal alcohol use when child was nine months or three-years-old	
Misuse of alcohol	1.38 (1.09-1.75)±
None to normal alcohol use	
Paternal illicit drug use when child was nine months or when child was three years	
Drug use	1.03 (0.71-1.48)
No drug use	
Paternal employment when child was nine months or three-years-old	
Father was unemployed intermittently when child was nine months or three years	1.46 (1.10-1.93)±
Father was employed when child was nine months and three-years-old	
Paternal stress levels when child was three years	
Father reported high stress levels	1.38 (1.07-1.77)±
Father reported normal stress levels	
Parental conflict when child was nine months or three years	
Parental conflict	1.47 (1.14-1.91)***
No parental conflict	
Family structure when child was three-years-old	
Single parent household	0.92 (0.64-1.33)
Two parent household	
Household income when child was three-years-old	
Low income	1.03 (0.85-1.24)
Mid to high income	

Variables significant at *** p<0.001, ** p<0.01, * p<0.05.

± After Bonferroni's correction was applied variable was no longer significant

5.4 Conclusion

The results suggest that almost 12% of five-year-old children in Ireland have an EBD and indicate that a range of child and family risk factors in early childhood increases the risk of EBD in five-year-old children in Ireland. Overall, the three most statistically significant predictors of EBD in five-year-old children were the presence of EBD at the age of three, the mother's use of harsh discipline when the child was three-years-old and high levels of self-reported stress amongst mothers. Other significant risk factors directly associated with the child included having a difficult temperament as a baby, the presence of a speech and language problem, or an illness or disability between the ages of three and five, and being male. Furthermore, a significant association between negative maternal parenting (insecure attachment and inconsistent parenting) and EBD in early childhood was also found in this study. Other significant family risk factors included maternal illness and being exposed to violence within the family in early childhood. These results are discussed in more detail in Chapter 8. In the next chapter, the prevalence of EBD in 13-year-old children in Ireland will be described, followed by the risk factors associated with emotional and behavioural outcomes within this cohort

Chapter 6 Results Study 2: Growing up in Ireland: The 13-year-old cohort

As indicated earlier in Chapter 4, Study 2 involved an analysis of GUI data to identify the prevalence of EBD in Irish children and investigate the extent to which risk factors identifiable in 9-year-old children can predict emotional and behavioural outcomes in 13-year-old children. The results of this study are outlined below.

6.1 Characteristics of baseline, follow-up and lost to follow-up populations

Child and parental characteristics of the baseline and 13-year-old follow-up cohorts, as well as those lost to follow-up at 13 years, are shown in Table 6.1. The results for the baseline and follow-up cohorts indicate that parental participants were typically aged 35-44 years, living in two-parent households and educated to secondary level or above. Marginally more of the child participants were female. Similar to the five-year-old cohort in Study 1, the children in the 'lost to follow-up' cohort at 13 years, were significantly ($p<.05$) more likely to live in a single parent household, have mothers who were younger and who left school early when compared to those who had completed the follow-up. However, these potential sources of bias were addressed during the re-weighting phase of the analysis to minimise the impact on the overall results (see chapter 4, section 4.2.1.3 for methods used in the re-weighting phase).

TABLE 6-1: CHARACTERISTICS OF BASELINE, FOLLOW-UP AND LOST TO FOLLOW-UP POPULATIONS (UNWEIGHTED).

	Baseline (Total N=8,568,100%)	Follow-up (N=7,488, 87%)	Lost to follow up (N=1,080, 13%)
Gender of study child	N (%)	N (%)	N (%)
Male	4,164 (48.6)	3659 (48.8)	505 (46.8)
Female	4,404 (51.4)	3829 (51.2)	575 (53.2)
Maternal age			
25-34 years	1,373 (16.0)	1,114 (14.8)	259 (24.0)
35-44 years	5,521 (64.4)	4,874 (65.1)	647 (59.9)
45+	1,674 (19.5)	1,500 (20.1)	174 (16.1)
Education level (Mother)			
Lower secondary or less	1,510 (17.6)	1,229 (16.4)	281 (26.0)
Completed secondary and above	7,058 (82.4)	6,259 (83.6)	799 (74.0)
Family structure			
Single parent household	991 (11.6)	812 (10.8)	179 (16.6)
Two parent household	7,577 (88.4)	6,676 (89.2)	901 (83.4)

6.2 Prevalence of EBD and associated risk factors in 13-year-olds

The analysis of the GUI data included the 7,488 children and their parents who were assessed at both baseline and follow-up. The overall prevalence of EBD among 13-year-old children in Ireland, according to parental report, was 12.3% (N=922) (95% CI 11.6%-13.1%). Boys (N=492, 12.9%) (95% CI 11.9%-14.0%) were slightly more likely to have EBD than girls (N=430, 11.7%) (95% CI-10.7%-12.8%), but unlike the younger cohort, the difference here was not statistically significant.

6.2.1 Individual childhood risk factors associated with EBD in 13-year-old children

Table 6.2 displays the individual childhood risk factors associated with EBD in 13-year-old children. Nine out of the ten risk factors examined, were significantly associated with EBD in 13-year-old children after Bonferroni's correction was applied (in order to perform the Bonferroni correction, the p-value under review was divided by the number of risk factors examined). Gender was the only risk factor not significantly associated with EBD in 13-year-old children. The risk factors associated with EBD included:

- Having an EBD at 9 years: Almost half (N=527, 47%) of children with an EBD at 9 years had similar difficulties at 13 years, compared to 6% (N=395) of children who had no EBD.
- Having a Specific Learning Difficulty (SLD): Over 40% (N=73, 42%) of children who had a SLD at nine years had an EBD at 13 years, compared to just over 10% (N=849,12%) of children without a SLD at this age.
- Being bullied at nine years: Over one fifth (N=410, 23%) of children who had been bullied at nine years had an EBD when they were 13-years-old, in comparison to less than one in ten (N=512, 9%) children who had not been bullied at this age.
- Having a chronic illness/disability: Over one quarter (N=228, 27%) of children who had a chronic illness/disability at nine years went on to have EBD at 13 years; this compares to just over 10% (N=694, 10%) of children without an illness/disability at this age.
- Having an emotional temperament: Over one third (N=325, 34%) of children who were described by their parents as having an emotional temperament (e.g., children who cry

easily or are frightened or anxious) at nine years had EBD at 13 years, compared to less than 10% (N=594, 9%) of children who were reported not to have an emotional temperament at this age.

TABLE 6-2: RISK FACTORS AT 9 YEARS ASSOCIATED WITH EBD IN 13-YEAR-OLD CHILDREN (N=7,488) (WEIGHTED)

	No EBD at 13 years (N=6,566) (87.7%)		EBD at 13 years (N=922) (12.3%)			
Individual risk factors at 9 years old	N	%	N	%	χ2	p value
Gender of child						
Male	3314	87.1%	492	12.9%	2.6	0.11
Female	3252	88.3%	430	11.7%		
Hours spent watching TV or using PC						
Less than 3 hours	5842	88.5%	756	11.5%	37.6	<0.001***
More than 3 hours	724	81.3%	166	18.7%		
EBD at nine years						
No EBD	5982	93.8%	395	6.2%	1490	<0.001***
Borderline or abnormal EBD	584	52.6%	527	47.4%		
Illness/disability at nine year						
No	5960	89.6%	694	10.4%	196.3	<0.001***
Yes	606	72.7%	228	27.3%		
Bullied at nine years						
No	5168	91.0%	512	9.0%	238.7	<0.001***
Yes	1393	77.3%	410	22.7%		
Missing data	5	100.0%	0	0.0%		
Self-esteem at nine years						
Low	835	79.9%	210	20.1%	107.9	<0.001***
Average/High	5306	89.6%	613	10.4%		
Missing data	425	81.1%	99	18.9%		
Specific learning difficulty at 9 years						
No	6467	88.4%	849	11.6%	148	<0.001***
Yes	99	57.6%	73	42.4%		
Temperament - Shyness						
Not shy	5736	88.5%	743	11.5%	29.3	<0.001***
Shy	825	82.5%	175	17.5%		
No data available	5	55.6%	4	44.4%		

TABLE 6.2: RISK FACTORS (AT 9 YEARS) ASSOCIATED WITH EBD IN 13-YEAR-OLD CHILDREN (N=7,488) (CONTINUED)

	No EBD N=6,566 (87.7%)		EBD N=922 (12.3%)			
Individual risk factors	N	%	N	%	χ2	p Value
Temperament- Emotional						
Not emotional	5936	90.9%	594	9.1%	487.1	<0.001***
Emotional	622	65.7%	325	34.3%		
No data available	8	72.7%	3	27.3%		
Temperament - Sociable						
Sociable	6085	88.7%	775	11.3%	79.3	<0.001***
Not sociable	442	76.1%	139	23.9%		
No data available	39	83.0%	8	17.0%		

χ2 =Pearson's chi-square
Variables significant at *** p<0.001, ** p<0.01, * p<0.05
No data refers to missing data or data not available due to the father not being involved in child's life.

6.2.2 The association between parenting practices and EBD at 13 years

The association between parenting practices in earlier childhood and EBD in 13-year-old children was examined next. This focuses on the quality of the parent-child relationship and parenting styles when the child was nine-years old and how they are associated with children's EBD at 13 years. Here, all six variables identified as potential risk factors, were significantly associated with EBD in 13-year-old children (after Bonferonni's correction was applied) (Table 6.3). These included:

- **Parent-child conflict:** One third (N=302, 36.2%) of children who had a difficult relationship with their mother at 9 years old, had EBD at 13 years, compared to only 9% (N=617) of children who did not have a difficult relationship with their mother at this age. Similarly

over 20% (N=139, 22.2%) of children who had a difficult relationship with their father at nine years had EBD at 13 years, in comparison to 9% (N=452) of children who did not.

- Parenting style: One in five (N=34, 20.0%) children who described their mothers' style of parenting as neglectful when they were 9 years old (e.g. neither showing warmth or control and often being uninvolved in their child's life) went on to have EBD at 13-years-old. This compares to just over one in ten children (N=646, 12.0%) who described their mothers' style of parenting as 'Authoritative' (e.g. Sticking to family rules, but also displaying warmth in their interactions with their child) at this age. A similar pattern was found for fathers' parenting style.
- Parental closeness: Over 20% (N=131, 21%) of children who did not have a close relationship with their mother when they were 9 years old, had EBD at 13 years, in comparison to just over 10% (N=787,12%) of children who did have a close relationship with their mother. A similar pattern was found for fathers.

TABLE 6-3: THE ASSOCIATION BETWEEN PARENTING PRACTICES AT 9 YEARS OLD AND EBD WHEN AGED 13 YEARS OLD (N=7,488) (WEIGHTED)

	No EBD N=6,566 (87.7%)		EBD at 13 years N=922 (12.3%)			
Parenting practices when child was 9 years old	N		N		χ2	p Value
Mother's level of closeness with child (reported by mother)						
Close relationship	6064	88.5%	787	11.5%	47.99	<0.001***
Does not have a close relationship	493	79.0%	131	21.0%		
No data available	9	75.0%	3	25.0%		
Father's level of closeness with child (reported by father)						
Close relationship with child	4687	90.4%	499	9.6%	23.28	<0.001***
Does not have a close relationship	376	83.2%	76	16.8%		
No data available	1396	80.9%	330	19.1%		
Mother's level of conflict with child (reported by mother)						
Low to no conflict	6018	90.7%	617	9.3%	495.25	<0.001***
High levels of conflict	534	64.0%	302	36.2%		
No data available	15	83.3%	3	16.7%		
Father's level of conflict with child (reported by mother)						
Low to no conflict	4688	91.2%	452	8.8%	109.5	<0.001***
High levels of conflict	486	77.8%	139	22.2%		
No data available	1393	80.8%	330	19.1%		
Mother's style of parenting (reported by child)						
Authoritative	4723	88.0%	646	12.0%	24.3	<0.001***
Authoritarian	219	81.1%	51	18.9%		
Permissive	1012	89.6%	118	10.4%		
Neglectful	136	80.0%	34	20.0%		
No data available	476	86.7%	73	13.3%		
Father's style of parenting (reported by child						
Authoritative	3910	89.4%	463	10.6%	14.7	0.002**
Authoritarian	421	85.4%	72	14.6%		
Permissive	1093	88.6%	141	11.4%		
Neglectful	306	84.3%	57	15.7%		
No data available	836	81.6%	189	18.4%		

χ2 =Pearson's chi-square

Variables significant at *** p<0.001, ** p<0.01, * p<0.05

No data refers to missing data or data not available due to the father not being involved in child's life.

6.2.3 The association between family risk factors and EBD in 13 year olds

The third analysis examined the association between family risk factors and EBD in 13-year-old children (Table 6.4). Following Bonferroni's correction (as before), all 11 variables were significantly associated with EBD in 13-year-old children. Selected variables are outlined below:

- Alcoholism/drug use in the family: Almost 30% (N=71, 29.0%) of children (at nine-years-old) who had a family member who suffers from alcoholism or uses drugs, went on to have EBD when they were 13-years-old, compared to just over 10% (851, 11.7%) of children who did not.
- Maternal depression: More than one quarter (N=165, 26.8%) of children who had a mother who suffered from depression when they were 9 years-old, had EBD at 13 years, compared to 10% (N=642) whose mothers did not suffer from depression at this age.
- Death of parent: Approximately one quarter (N=49, 25.9%) of children whose mother or father died before they were nine-years-old, went on to have EBD at 13 years, compared to 12% (n=873) of children who did not experience bereavement during this period.
- Parental conflict: Over 20% (N=201, 22.6%) of children who lived in a household where they were exposed to domestic violence (at 9 years-old), had EBD at 13 years; this compares to only one in ten (N=721, 10.9%) of children who were not exposed to domestic violence at this age.

TABLE 6-4: THE ASSOCIATION BETWEEN FAMILY RISK FACTORS AT 9 YEARS OLD AND EBD WHEN AGED 13 (N=7,488) (WEIGHTED)

	No EBD at 13 years N=6,566 (87.7%)		EBD at 13 years N=922 (12.3%)			
Family risk factors	N	%	N	%	χ2	p Value
Family member has a chronic illness/disability						
No	5733	88.4%	753	11.6%	22.2	<0.001***
Yes	833	83.1%	169	16.9%		
Alcoholism/drugs by family member						
No	6392	88.3%	851	11.7%	62.8	<0.001***
Yes	174	71.0%	71	29.0%		
Mother suffers from depression						
Not depressed	5512	89.6%	642	10.4%	149.2	<0.001***
Depressed	450	73.2%	165	26.8%		
No data available	604	84.0%	115	16.0%		
Father suffers from depression						
Not depressed	4491	90.7%	460	9.3%	127.1	<0.001***
Depressed	181	86.2%	29	13.8%		
No data available	1894	81.4%	433	18.6%		
Parental conflict						
No	5878	89.1%	721	10.9%	98.7	<0.001***
Yes	688	77.4%	201	22.6%		
Death of a parent						
No	6426	88.0%	873	12.0%	33.3	<0.001***
Yes	140	74.1%	49	25.9%		
Parental divorce/separation						
No	5703	89.0%	702	11.0%	75.1	<0.001***
Yes	863	79.7%	220	20.3%		
Mother's education level						
Lower secondary or less	1807	80.9%	427	19.1%	136.4	<0.001***
Completed secondary and above	4759	90.6%	495	9.4%		
Father's education level						
Lower secondary or less	1634	84.8%	292	15.2%	162.5	<0.001***
Completed secondary and above	3551	92.2%	301	7.8%		
No data available	1381	80.8%	329	19.2%		

χ2 =Pearson's chi-square, Variables significant at *** p<0.001, ** p<0.01, * p<0.05

No data refers to missing data or data not available due to the father not being involved in child's life

TABLE 6.4: THE ASSOCIATION BETWEEN FAMILY RISK FACTORS AND EBD IN 13 YEAR OLDS (N=7,488) (CONTINUED)

	No EBD N=6,566 (87.7%)		EBD N=922 (12.3%)			
	N	%	N	%	χ2	p Value
Family structure						
Single parent	1067	80.2%	263	19.8%	84.8	<0.001***
Two parent	5499	89.3%	659	10.7%		
Household income						
Lowest	2280	82.4%	488	17.6%	119.3	<0.001***
Middle	1238	89.3%	148	10.7%		
High	2607	91.8%	233	8.2%		
No data available	441	89.5%	53	10.5%		

χ2 =Pearson's chi-square
Variables significant at *** p<0.001, ** p<0.01, * p<0.05

6.3 Predicting EBD in 13- year old children

For purposes of the next stage of analysis, logistic regression was used to predict EBD in 13-year-old children. Variables associated with EBD - based on the results shown above were divided into three groups including: 'individual risk factors' (Model 1), 'parenting practices' (Model 2), and 'family risk factors' (Model 3). All variables found to be significant in the unadjusted models were then combined to produce Model 4, which displays the overall predictors of EBD in 13-year-olds. Earlier in the chapter, it was reported that there was no significant difference between the proportion of boys with EBD and the proportion of girls. However, there are likely to be some confounding factors related to EBD and gender, which are influenced by child, parenting and family factors as described (12, 30, 204). For this reason, model four was performed separately for boys and girls to produce models five and six respectively. Finally, model seven looked at

cumulative risk as a predictor of EBD in 13-year-old children. The results are described and illustrated below for each of the three groups of risk factors.

6.3.1 Individual risk factors as predictors of EBD in 13-year-old children

Table 6.5 presents the unadjusted and adjusted logistic regression models of the individual (child) risk factors predicting EBD in 13-year-old children. As shown, seven out of the nine variables examined, were significant predictors of EBD. Those not significant in the adjusted model include watching screens (TV/PC) and being shy at age nine. In the adjusted model, the odds ratios ranged from 1.11 to 8.10 for those reaching significance. The most significant predictor in the adjusted model was having EBD at the age of nine. The odds of having EBD at 13 years is 8 times higher for children who had EBD when aged 9 than for children who did not have EBD at 9 years old. This was followed by having a specific learning difficulty, which showed the odds of having EBD at 13 years, was three times higher for children who had a specific learning difficulty at 9 than children who did not have a specific learning difficulty at this age.

TABLE 6-5: MODEL 1: UNADJUSTED AND ADJUSTED ORS (95% CI) OF INDIVIDUAL PREDICTORS OF EBD IN 13-YEAR-OLDS (WEIGHTED).

Individual risk factors (*reference category)*	Unadjusted Model Odds Ratios and 95% CIs	Adjusted Model Odds Ratios and 95% Cis
Screen time		
Watched or used PC more than 3 hours per day	1.77 (1.47-2.13)***	1.11 (0.89-1.39)
Did not watch or use PC more than 3 hours per day		
EBD at nine years		
Had EBD	13.67 (11.70-15.97)***	8.10 (6.78-9.68)***
Did not have EBD		
Chronic illness/disability at nine years		
Had a chronic illness/disability	3.23 (2.71-3.82)***	1.57 (1.26-1.94)***
Did not have a chronic illness/disability		
Bullied at nine years		
Was bullied	2.92 (2.58-3.43)***	1.65 (1.39-1.95)***
Was not bullied		
Self-esteem at nine years		
Had low level of self-esteem	4.00 (3.00-5.33)***	2.09(1.51-2.88)***
Had normal levels of self-esteem		
Specific learning difficulty at nine years		
Had a specific learning difficulty	5.60 (4.11-7.64)***	3.03 (2.08-4.43)***
Did not have a specific learning difficulty		
Temperament - Shy at nine years		
Was very shy	1.64 (1.37-1.96)***	0.77 (0.61-1.02)
Was not very shy		
Temperament - Emotional at nine years		
Very emotional	5.21 (4.45-6.11)***	2.32 (1.91-2.81)***
Not emotional		
Temperament -Sociable at nine years		
Was not sociable	2.48 (2.02 -3.04)***	1.53 (1.18-1.98)***
Was sociable		

Adjusted model is for all predictors identified as significant in the unadjusted models.
Variables significant at *** p<0.001, ** p<0.01, * p<0.05.

6.3.2 Parenting practices as predictors of EBD in 13-year-old children

Table 6.6 presents the unadjusted and adjusted logistic regression models for the variables associated with parenting practices and how they predict EBD in 13-year-old children. All seven of the parenting variables were significant in the unadjusted model, although only three remained significant in the adjusted model after Bonferonni's correction was applied. As shown in Table 6.7, the odds ratios for these variables ranged from 1.48 to 4.68. The most statistically significant predictor in the adjusted model was the mother reporting high levels of conflict with the child when s/he was nine-years-old. The odds of having EBD at 13 years is more than four times greater for children whose mother reported high levels of conflict than for children whose mothers did not. Similarly, the odds of having EBD at 13 years is almost two times greater for children whose father reported high levels of conflict than for children whose fathers did not.

6.3.3 Family risk factors as predictors of EBD in 13-year-olds

Family risk factors were examined next. Table 6.7 presents the unadjusted and adjusted logistic regression models and the extent to which these variables predict EBD in 13-year-old children. A total of 11 variables were examined, 7 of which remained significant in the adjusted model after Bonferonni's correction was applied. The odds ratios for these variables ranged from 1.34 to 2.19. The most statistically significant predictor in the adjusted model was the mother suffering from depression when the child was nine-years-old. The odds of having EBD at 13 years is more than two times greater for children whose mother suffered from depression than for children whose mothers did not.

TABLE 6-6: MODEL 2: UNADJUSTED AND ADJUSTED ORS (95% CI) OF PARENTING (PARENTING PRACTICES) PREDICTORS OF EBD IN 13-YEAR-OLDS (WEIGHTED)

Parenting practices as risk factors *(reference category)*	Unadjusted Model Odds Ratios and 95% Cis	Adjusted Model Odds Ratios and 95% Cis
Level of closeness with nine-year-old reported by mother		
Low level of closeness	2.05 (1.67-2.52)***	1.48 (1.18-1.87)***
Close relationship		
Level of closeness with nine-year-old reported by father		
Low level of closeness	2.22 (1.91-2.59)***	1.07 (0.80-1.44)
Close relationship		
Level of conflict with nine-year-old reported by mother		
High level of conflict	5.51 (4.68-6.49)***	4.68 (3.92-5.57)***
No conflict		
Level of conflict with nine-year-old reported by father		
High level of conflict	2.98 (2.41-3.68)***	1.86 (1.47-2.36)***
No conflict		
Parenting style-Mother (child reported at nine years)		
Authoritarian parenting	1.70 (1.24-2.33)**	1.51 (1.05-2.17)*±
Authoritative parenting		
Permissive parenting	0.85 (0.69-1.05)	0.89 (0.71-1.13)
Authoritative parenting		
Neglectful parenting	1.83 (1.25-2.69)**	1.48 (0.96-2.28)
Authoritative parenting		
Parenting style-Father (child reported at nine years)		
Authoritarian parenting	1.44 (1.10-1.88)**	1.37 (1.09-1.71)*±
Authoritative parenting		
Permissive parenting style	1.09 (0.89-1.33)	1.06 (0.85-1.33)
Authoritative parenting		
Neglectful parenting	1.59 (1.18-2.14)***	1.33 (0.95-1.87)
Authoritative parenting		

Adjusted model is for all predictors identified as significant in the unadjusted models.
Variables significant at *** p<0.001, ** p<0.01, * p<0.05.
± Variable no longer significant after bonferonni's adjustment was applied.

TABLE 6-7: MODEL 3: UNADJUSTED AND ADJUSTED ORS (95% CI) OF FAMILY PREDICTORS OF EBD IN 13-YEAR-OLDS (WEIGHTED)

Family risk factors *(reference category)*	Unadjusted Model Odds Ratios and 95% Cis	Adjusted Model Odds Ratios and 95% Cis
Level of education - mother		
Low level of education	2.28 (1.98-2.62)***	1.64 (1.41-1.92)***
Completed secondary or more		
Low level of education - father		
Low level of education	2.11 (1.78-2.50)***	1.38 (0.95-2.00)
Completed secondary or more		
Death of parent		
Nine-year-old experienced the death of parent	2.54 (1.82-3.55)***	1.77 (1.23-2.56)**
Nine-year-old did not experience the death of parent		
Parental divorce/separation		
Nine-year-old experienced parental divorce/separation	2.07 (1.75-2.45)***	0.96 (0.74-1.25)
Nine-year-old did not experienced parental divorce/separation		
Drug addiction or alcoholism in family		
Nine-year-old had a family member who suffers from alcoholism or uses drugs	3.04 (2.28-4.04)***	1.60 (1.17-2.19)**
Nine-year-old who does not have a family member who suffers from alcoholism or uses drugs		
Chronic illness/disability		
Family member had chronic illness/disability when child was nine years old	1.54 (1.28-1.84)***	1.34 (1.11-1.63)**
Family member did not have chronic illness/disability when child was nine years old		

Adjusted model is for all predictors identified as significant in the unadjusted models.
Variables significant at *** p<0.001, ** p<0.01, * p<0.05.

TABLE 6.7: MODEL 3: UNADJUSTED AND ADJUSTED ORS (95% CI) OF FAMILY PREDICTORS OF EBD IN 13-YEAR-OLDS (CONTINUED)

Family risk factors *(reference category)*	Unadjusted Model Odds Ratios and 95% Cis	Adjusted Model Odds Ratios and 95% Cis
Depression – Mother		
Mum suffered from depression when child was nine years old	3.14 (2.58-3.82)***	2.19 (1.78-2.71)***
Mum did not suffer from depression when child was nine years old (reference category)		
Depression – Father		
Dad suffered from depression when child was nine years old	1.54 (1.02-2.30)*	1.08 (0.70-1.65)
Dad did not suffered from depression when child was nine years old (reference category)		
Family structure		
Nine-year-old lived in a single-parent household	2.06 (1.76-2.41)***	0.83 (0.59-1.15)
Nine-year-old lived in a two-parent household (reference category)		
Family income		
Nine-year-old lived in a low income household	2.39 (2.03-2.82)***	1.52 (1.26-1.83)***
Nine-year-old lived in a high income household (reference category)		
Nine-year-old lived in a middle income	1.34 (1.08-1.66)**	1.10 (0.88-1.38)
Nine-year-old lived in a high income household (reference category)		
Parental conflict		
Nine-year-old lives in a household where there is parental conflict	2.37 (1.99-2.83)***	1.68 (1.34-2.11)***
Nine-year-old lives in a household where there is no parental conflict (reference category)		

Adjusted model is for all predictors identified as significant in the unadjusted models.
Variables significant at *** p<0.001, ** p<0.01, * p<0.05.

6.3.4 Overall predictors of EBD in 13-year-olds.

All variables found to be significant in models one to three (unadjusted models) were then included in model four (see Table 6.8). The odds ratios for the significant variables in this model

ranged from 1.50 to 6.26. Of the 26 risk factors examined in model four, only eight remained significant in the adjusted model (after Bonferonni's correction was applied). Most of these were risk factors directly associated with the child; for example, having an emotional temperament at nine, having been bullied, or having had low self-esteem at nine-years-old. The most significant risk factor associated with EBD in 13-year-old children, was having EBD when aged 9; this was followed by having a SLD at this age. With regard to parenting practices, the only variable that remained significant, was high levels of mother/child conflict (as reported by the mother). Of the 10 family risk factors examined in the final model, only one remained significant - the mother suffering from depression when the child was nine-years-old.

Models five and six (Table 6.8) present the risk factors examined in model four stratified by gender. Within the child risk factors, a number appear to be influenced by gender. For example, boys who had a chronic illness or disability, or who had a SLD were more at risk of EBD than girls with the same risk factors. On the other hand, girls who were bullied or had a low self-esteem were significantly more likely to have EBD at 13 years than boys who experienced the same issues at this age. With regard to family risk factors, girls appeared to be more at risk of EBD if their mother suffered from depression but conversely, this risk factor was not significant for boys. On the other hand, boys who were exposed to alcoholism or drug misuse within the family were at risk of EBD, whereas girls were not.

TABLE 6-8: MODELS 4-6: OVERALL PREDICTORS OF EBD IN 13-YEAR-OLDS (STRATIFIED BY GENDER) (WEIGHTED)

	Model 4 (All)	Model 5 (Male)	Model 6 (Female)
All risk factors *(reference category)*	Adjusted Model Odds Ratios and 95% Cis	Adjusted Model Odds Ratios and 95% Cis	Adjusted Model Odds Ratios and 95% Cis
Screen time			
Watched TV or used PC more than 3 hours per day	1.05 (0.84-1.32)	0.96 (0.70-1.31)	1.20 (0.78-160)
Did not watch TV or use PC more than 3 hours per day			
EBD at nine years			
Had EBD	6.26 (5.17-7.61)***	7.84 (5.97-10.30)***	5.73 (4.26-7.12)***
Did not have EBD			
Chronic illness/disability at nine years			
Had a chronic illness/disability	1.50 (1.20-1.88)***	1.68 (1.24-2.27)***	1.34 (0.94-1.92)
Did not have a chronic illness/disability			
Bullied at nine years			
Was bullied	1.55 (1.30-1.85)***	1.19 (0.92-1.54)	1.97 (1.53-2.55)***
Was not bullied			
Self-esteem at nine years			
Had low level of self-esteem	1.87 (1.27-2.77)**	1.57 (0.92-2.68)	2.34 (1.27-4.31)***
Had normal levels of self-esteem			
Specific learning difficulty (SLD) at nine years			
Had a specific learning difficulty	2.81 (1.89-4.16)***	2.67 (1.59-4.47)***	2.74 (1.38-5.47)**±
Did not have a specific learning difficulty			
Temperament- Shy at nine years			
Was very shy	0.72 (0.56-0.91) **±	0.67 (0.48-0.94)*±	0.80 (0.57-1.15)
Was not very shy			
Temperament- Emotional at nine years			
Highly emotional	1.92 (1.57-2.35)***	2.16 (1.61-2.90)***	1.79 (1.33-2.41)***
Not emotional			
Temperament - Sociable at nine years			
Not sociable	1.64 (1.26-2.14)**±	1.88 (1.30-2.73)**±	1.32 (0.87-.199)
Sociable			

Adjusted model is for all predictors identified as significant in the unadjusted models.
Variables significant at *** p<0.001, ** p<0.01, * p<0.05.
± Variable no longer significant after bonferonni's correction was applied.

TABLE 6.8: MODELS 4-6: OVERALL PREDICTORS OF EBD IN 13-YEAR-OLDS (STRATIFIED BY GENDER) (CONTINUED)

	Model 4 (All)	Model 5 (Male)	Model 6 (Female)
All risk factors *(reference category)*	Adjusted Model Odds Ratios and 95% Cis	Adjusted Model Odds Ratios and 95% Cis	Adjusted Model Odds Ratios and 95% Cis
Parenting practices as risk factors			
Level of closeness with nine-year-old reported by mother			
Low level of closeness	1.23 (0.95-1.61)	1.22 (0.86-1.72)	1.32 (0.85-2.04)
Close relationship			
Level of closeness with nine-year-old reported by father			
Low level of closeness	0.98 (0.70-1.36)	0.82 (0.52-1.31)	1.13 (0.68-1.86)
Close relationship			
Level of conflict with nine-year-old reported by mother			
High level of conflict	1.80 (1.45-2.24)***	1.89 (1.39-2.58)***	1.79 (1.30-2.47)***
No conflict			
Level of conflict with nine-year-old reported by father			
High level of conflict	1.11 (0.84-1.47)	1.09 (0.74-1.57)	1.21 (0.78-1.90)
No conflict			
Parenting style-Mother (child reported at nine years)			
Authoritarian parenting -Mother	1.15 (0.76-1.75)	1.39 (0.85-2.27)	0.92 (0.39-2.19)
Authoritative parenting -Mother			
Permissive parenting -Mother	0.85 (0.66-1.11)	0.90 (0.61-1.34)	0.84 (0.58-1.21)
Authoritative parenting –Mother			
Neglectful parenting -Mother	1.10 (0.66-1.13)	0.52 (0.24-1.11)	2.76 (1.37-5.57)**±
Authoritative parenting -Mother			
Parenting style-Father (child reported at nine years)			
Authoritarian parenting – Father	1.15 (0.82-0.61)	0.93 (0.60-1.47)	1.46 (0.87-2.45)
Authoritative parenting -Father			

Adjusted model is for all predictors identified as significant in the unadjusted models.
Variables significant at *** p<0.001, ** p<0.01, * p<0.05.
± Variable no longer significant after bonferonni's correction was applied.

TABLE 6.8: MODELS 4-6: OVERALL PREDICTORS OF EBD IN 13-YEAR-OLDS (STRATIFIED BY GENDER) (CONTINUED)

	Model 4 (All)	Model 5 (Male)	Model 6 (Female)
All risk factors *(reference category)*	Adjusted Model ORs and 95% CIs	Adjusted Model ORs and 95% CIs	Adjusted Model ORs and 95% CIs
Permissive parenting style -Father	1.09 (0.84-1.40)	1.02 (0.70-1.50)	1.13 (0.79-1.63
Authoritative parenting -Father (reference category)			
Neglectful parenting -Father	1.31 (0.89-1.94)	1.18 (0.67-2.09)	1.35 (0.77-2.35)
Authoritative parenting -Father			
Family risk factors			
Level of education - mother			
Low level of education	1.26 (1.05-1.51)*±	1.12 (0.86-1.46)	1.30 (0.99-1.70)
Completed secondary or more			
Low level of education - father			
Low level of education	1.22 (0.98-1.52)	1.03 (0.76-1.39)	1.72 (1.23-2.26)*±
Completed secondary or more			
Death of parent			
Nine-year-old experienced the death of parent	1.40 (0.90-2.16)	1.26 (0.61-2.58)	1.77 (0.98-3.20)
Nine-year-old did not experience the death of parent			
Parental divorce/separation			
Nine-year-old experienced parental divorce/separation	0.83 (0.62-1.11)	0.82 (0.53-1.26)	0.81 (0.53-1.25)
Nine-year-old did not experienced parental divorce/separation			
Drug addiction or alcoholism in family			
Nine-year-old had a family member who suffers from alcoholism or uses drugs	1.74 (1.19-2.54)**±	2.40 (1.34-4.28)***	1.41 (0.83-2.38)
Nine-year-old who does not have a family member who suffers from alcoholism or uses drugs			

Adjusted model is for all predictors identified as significant in the unadjusted models.
Variables significant at *** p<0.001, ** p<0.01, * p<0.05.
± Variable no longer significant after bonferonni's correction was applied.

TABLE 6.8: MODELS 4-6: OVERALL PREDICTORS OF EBD IN 13-YEAR-OLDS (STRATIFIED BY GENDER) (CONTINUED).

	Model 4 (All)	Model 5 (Male)	Model 6 (Female)
All risk factors *(reference category)*	Adjusted Model ORs and 95% CIs	Adjusted Model ORs and 95% CIs	Adjusted Model ORs and 95% CIs
Chronic illness/disability			
Family member had chronic illness/disability when child was nine	1.10 (0.87-1.38)	1.34 (0.97-1.85)	0.91 (0.65-1.28)
Family member did not have chronic illness/disability when child was nine			
Depression – Mother			
Mum suffered from depression when child was nine years old	1.54 (1.20-1.97)***	1.35 (0.93-1.95)	1.89 (1.33-2.70)***
Mum did not suffer from depression when child was nine years old			
Depression – Father			
Dad suffered from depression when child was nine years old	0.86 (0.53-1.41)	0.92 (0.65-1.62)	0.95 (0.61-1.56)
Dad did not suffered from depression when child was nine years old			
Family structure			
Nine-year-old lives in a single-parent household	1.34 (0.91-1.98)	0.72 (0.37-1.43)	1.86 (1.13-3.08)*±
Nine-year-old lives in a two-parent household			
Family income			
Nine-year-old lives in a low income household	1.24 (0.85-1.79)	1.42 (0.88-2.28)	1.59 (1.14-2.20)*±
Nine-year-old lives in a high income household			
Nine-year-old lives in a middle income	1.34 (1.08-1.66)**±	1.24 (0.92-1.67)	1.13 (0.75-1.70)
Nine-year-old lives in a high income household			
Parental conflict			
Nine-year-old lives in a household where there is parental conflict	1.08 (0.83-1.40)	0.88 (0.60-1.27)	1.33 (0.91-1.95)
Nine-year-old lives in a household where there is no parental conflict			

Adjusted model is for all predictors identified as significant in the unadjusted models.
Variables significant at *** p<0.001, ** p<0.01, * p<0.05,
± Variable no longer significant after bonferonni's correction was applied

6.3.5 Cumulative risk of EBD in 13-year-old children

The nine variables found to be significant in models 4-6 (see Figure 6.1 below) were then used to calculate the cumulative risk of EBD in 13-year-old children. Cumulative risk was calculated by counting the number of risks each child had (ranging from 0-9 risks). Children were then recoded into two categories, those with 0-2 risks and those with 3+ risks.

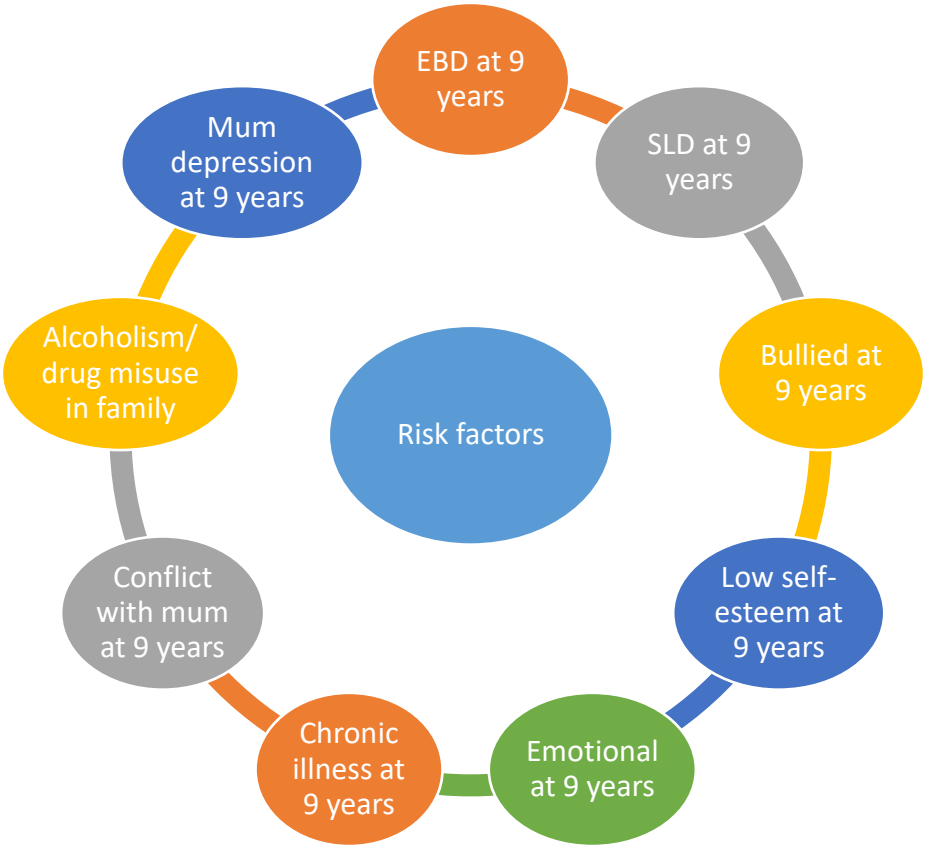

FIGURE 6-1: OVERALL RISKS OF EBD IN 13-YEAR-OLD CHILDREN

Table 6.9 displays the association between cumulative risk and EBD in this cohort. Perhaps unsurprisingly, there is a significant association between the number of risk factors to which a child is exposed at the age of 9 and their likelihood of having EBD at 13 years. For example, less than five percent (N=268, 4.5%) of children who had two or less risk factors at the age of 9, had

EBD at 13 years, compared to 44% (N=505) of children with 3 or more risk factors at this age. Finally, Table 6.10 displays cumulative risk as a predictor of EBD in 13-year-old children. It shows that 9-year-old children who had 3 or more child, parental or family risk factors were almost 17 times more likely to have EBD at 13 years, than children who had less than 3 risk factors at this age.

TABLE 6-9: CUMULATIVE RISK ASSOCIATED WITH EBD IN 13-YEAR-OLD CHILDREN (WEIGHTED)

	No EBD (N=6566, 87.7%)		Borderline or abnormal EBD (N=922, 12.3%)			
Cumulative risk	N	%	N	%	X_2	p Value
0-2 risks	5724	95.5%	268	4.5%	1707	<0.001***
3+ risks	842	56.3%	505	43.7%		

χ2 =Pearson's chi-square
Variables significant at *** p<0.001, ** p<0.01, * p<0.05

TABLE 6-10: MODEL 7: CUMULATIVE RISK AS A PREDICTOR OF EBD IN 13-YEAR-OLD CHILDREN (WEIGHTED).

Number of risk factors at nine years	Unadjusted Odds Ratios and 95% Cis
Cumulative risk	
3+ risks	16.61 (14.16-19.49)***
0-2 risks (reference category)	

Variables significant at *** p<0.001, ** p<0.01, * p<0.05

6.4 Conclusion

This chapter began by looking at the prevalence of EBD among 13-year-old children in Ireland. The results indicate that more than one in eight (12%) 13-year-old children in this country have EBD. This figure is similar to the prevalence rate reported in the younger cohort (Chapter 5). The results suggest that a range of child and family risk factors in childhood can increase the risk of

EBD in 13-year-old children. Overall, the three most statistically significant predictors of EBD were all directly associated with the child and included the presence of EBD at the age of nine, having a SLD at this age and having an emotional temperament. Other significant risk factors directly associated with the child, included having low self-esteem, having been bullied at nine and having a chronic illness or disability at this age. Whilst a number of parenting risk factors were examined, only one remained significant in the overall model – the extent to which the mother reported a high level of conflict between her and her nine-year-old child.

With regard to the family risk factors, despite a number of factors reaching significance in model three, only one remained significant in the final model: the mother suffering from depression when the child was nine-years-old. The gender-stratified models (Models 5 and 6) showed some interesting differences by gender, in that boys who had a chronic illness or disability or who had a SLD, were more at risk of EBD, than girls, while girls who were bullied were significantly more likely to have EBD at 13 years than boys who were bullied. Interestingly, having low self-esteem at nine was a significant risk factor for girls, but not boys. Girls also appear to be more at risk of EBD if their mother suffers from depression; this risk factor was not significant for boys. On the other hand, boys who were exposed to alcoholism or drug misuse within the family were at risk of EBD, but this was not the case for girls. Finally, cumulative risk was examined in this study and, unsurprisingly, the greater the number of risk factors at the age of nine; the more likely a child was to have EBD at the age of 13. These results will be discussed in the final chapter in this thesis. In the next chapter, the results of a feasibility study testing the effectiveness of an online parenting intervention aimed at reducing EBD in children, will be presented.

Chapter 7 Results Study 3: A study to test the feasibility of Triple P Online (TPOL)

This chapter describes the results of a study conducted to test the feasibility and acceptability of TPOL. Information is presented on the feasibility of recruitment, adherence to the intervention, acceptability of the intervention as well as preliminary estimates of clinical outcomes with respect to child behaviour, parenting skills, mood, and family functioning. This chapter follows the CONSORT statement for pilot and feasibility studies (196). The methods were described earlier in Chapter 4 (Section 4.3).

7.1 Recruitment and retention

A multifaceted approach to recruitment was adopted as described in Chapter 4. Thirty-six participants were assessed for eligibility to participate in the study. Twenty-three parents were assessed after responding to the advertisement on the 'mummypages' website, eight were assessed after hearing about the study through a friend or family member while the remaining five had received an email about the study from their child's school principal. Twelve of the 36 did not meet the inclusion criteria (eight children did not have an EBD as measured by the SDQ, two children had autism, one child had an intellectual disability and one child was seeking treatment from a professional for his EBD); all were excluded from the study (see Figure 7.1). Therefore, the final sample comprised 22 parents who completed baseline assessments and were then randomly allocated to TPOL (n =15) or the wait-list control condition (n=7) on a 2:1 ratio. One TPOL parent did not start the programme as they had unforeseen family commitments. However, this parent is included in all analyses as she had completed baseline

measures. Post-intervention assessments were completed by all 21 parents (intervention n=14, control n=7), representing a very high retention rate of 95% (see Figure 7.1). Parents were recruited to the study between October 2016 and May 2017 and follow-up assessments were completed by the end of August 2017

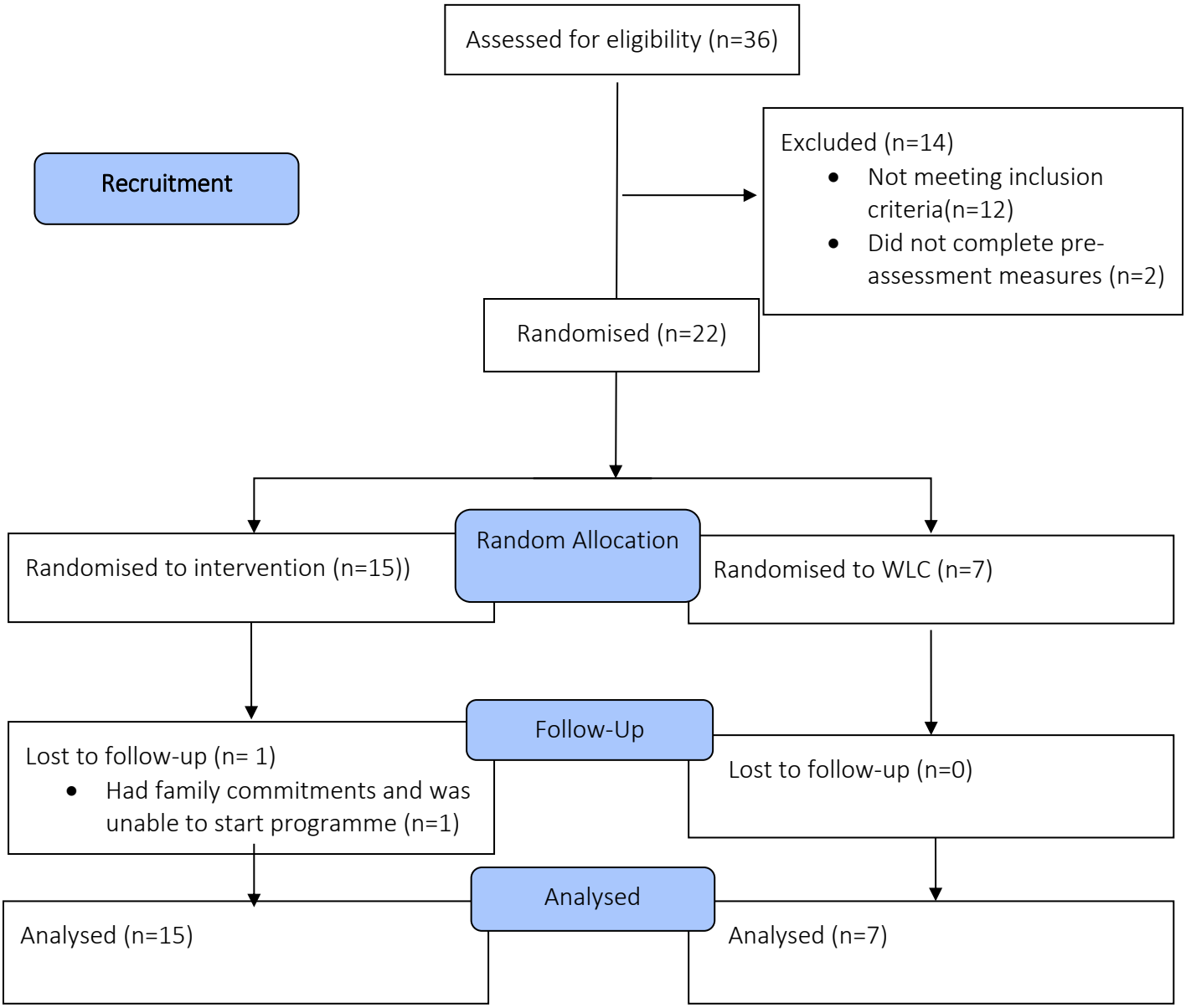

FIGURE 7-1: CONSORT DIAGRAM SHOWING THE FLOW OF PARENTS THROUGH EACH STAGE OF THE TRIAL

7.2 Baseline characteristics of the intervention and control groups

A baseline analysis of the characteristics of the intervention and control groups indicated that there were no significant differences between the two groups with regard to either demographic characteristics (Table 7.1) or their scores on the psychometric measures (Table 7.2). All participants had a child aged 4 to 9 years (M=5.8, SD =1.5) with borderline to severe levels of EBD as reflected by their responses on the SDQ. Slightly more parents reported being concerned about boys (55%), than girls (45%). Almost three-quarters (73%) of the children were living in a two-parent family with 27% living in a single parent household. Parents participating in the study were mainly mothers (95%) who were typically in their late thirties (M=38.3, SD = 5.5, range 27 to 47 years) while almost two-thirds (62%) worked on either a full-time or part-time basis. Overall, the sample had very high levels of educational attainment, with 73% having attained a third level qualification compared to 45% in the general population (Central Statistics Office, 2017). The vast majority (86%) were born in Ireland. All parents reported accessing the Internet every day or several times a week.

TABLE 7-1: DIFFERENCES BETWEEN INTERVENTION AND CONTROL GROUP AT BASELINE (CHI-SQUARE ANALYSES)

Variable	Triple P Online (n=15)		Control (n=7)			
	N	%	n	%	χ^2	P
Child gender					1.18	.38
Male	7	46.7	5	71.4		
Participants					-	-
Mother	14	93.3	7	100		
Father	<5	6.7	-	-		
Family composition					1.25	.33
2 parent family	12	80.0	<5	57.1		
Single parent family	<5	20.0	<5	42.9		
Marital status					1.12	.38
Married	10	66.7	<5	42.9		
Other	5	33.3	<5	57.1		
Ethnic group					-	-
Irish	13	86.7	6	85.7		
Other	<5	13.3	<5	14.3		
Education					.577	.63
Completed 2nd level	<5	26.7	<5	42.9		
Completed 3rd level	11	73.3	<5	57.1		
Employment					.016	1.00
Fulltime/part-time	9	60.0	<5	57.1		
Unemployed	6	40.0	<5	42.9		

M=Mean, SD=Standard Deviation, χ^2=Pearson's chi-square

TABLE 7-2: DIFFERENCES BETWEEN INTERVENTION AND CONTROL GROUP AT BASELINE (USING UNIVARIATE ANOVA)

	Triple P Online (n=15)		Control (n=7)			
	Mean	SD	Mean	SD	F(df)	p
Child age	6.07	1.49	5.28	1.89	1.11 (1)	0.30
Respondents age	37.47	5.55	40.0	5.39	1.01 (1)	0.33
No. of children at home	2.67	1.35	2.43	0.5	.20 (1)	0.66
SDQ	14.93	1.28	14.85	1.21	.02 (1)	0.90
Parenting Scale						
Laxness	3.31	0.74	3.62	0.7	0.9 (1)	0.36
Over-reactivity	3.46	1.17	3.44	0.47	0 (1)	0.98
Verbosity	4.1	0.85	4.31	0.38	0.38 (1)	0.54
DASS-21						
Anxiety	4.8	1.01	4.57	0.98	0.25 (1)	0.62
Depression	5.33	1.95	4.28	2.13	1.3 (1)	0.27
Stress	10.26	3.01	10.86	2.79	0.19 (1)	0.67
	Triple P Online (n=12)		Control (n=4)			
Parent Problem Checklist ±						
Problem	4.42	1.24	4.75	1.26	0.22 (1)	0.65
Extent	31.08	11.91	36.0	7.64	0.71 (1)	0.41
Relationship Quality Index ±	31	9.03	33.75	4.92	0.33 (1)	0.58

F = univariate ANOVA effect for condition; P=Significance level
±Single parents did not complete the PPC or RQI.

7.3 Feasibility and acceptability of intervention

Of the 14 parents who had started the programme (i.e., used TPOL at least once), half had completed all eight modules at the 3-month follow-up. Eleven parents (80%) had completed three or more modules. The mean number of completed modules was 5.5. The seven parents who completed all eight modules logged on an average of 22 times (range 10 to 48). They completed the programme in an average of 9.4 weeks (range 3.4 to 12.0 weeks). Table 7.3 provides a breakdown of intervention use and completion rates at follow-up. The seven

parents who did not complete all eight modules were asked to give reasons for non-completion. Four reported that they did not have time to complete it due to family or work commitments, one parent said they felt it was more suitable for parents with very young (0-3 year olds) children. Two parents did not give a reason for not completing the programme.

TABLE 7-3: PERCENTAGE OF PARENTS WHO COMPLETED EACH TPOL MODULE

Module	Module completed n (%)
1. What is positive parenting?	14 (100)
2. Encouraging behaviour you like	13 (93)
3. Teaching new skills	11 (80)
4. Managing misbehaviour	9 (64)
5. Dealing with disobedience	8 (57)
6. Preventing problems by planning ahead	8 (57)
7. Making shopping fun	8 (57)
8. Raising confident, capable kids	7 (50)

7.4 Parent satisfaction with the intervention

Parents in the intervention group reported high levels of satisfaction with the online parenting programme as measured by the CSQ, with a mean score of 70.57 out of 91 (SD = 6.33). More than three-quarters (79%) indicated overall satisfaction with the programme. Twelve (86%) of the 14 parents felt that the quality of the programme was 'good' or 'excellent', one (7%) provided a neutral rating whilst one (7%) felt that the quality of the programme was poor. In the latter case, this was the same parent who felt that the programme was more appropriate for parents with younger children (her child was eight-years-old). Furthermore, 10 (71%) parents reported that the programme helped them to deal more effectively with their child's behaviour,

two (14%) parents rated this as neutral and two (14%) parents reported that the programme did not help them. All the results from the CSQ are presented in Figure 7.2 below.

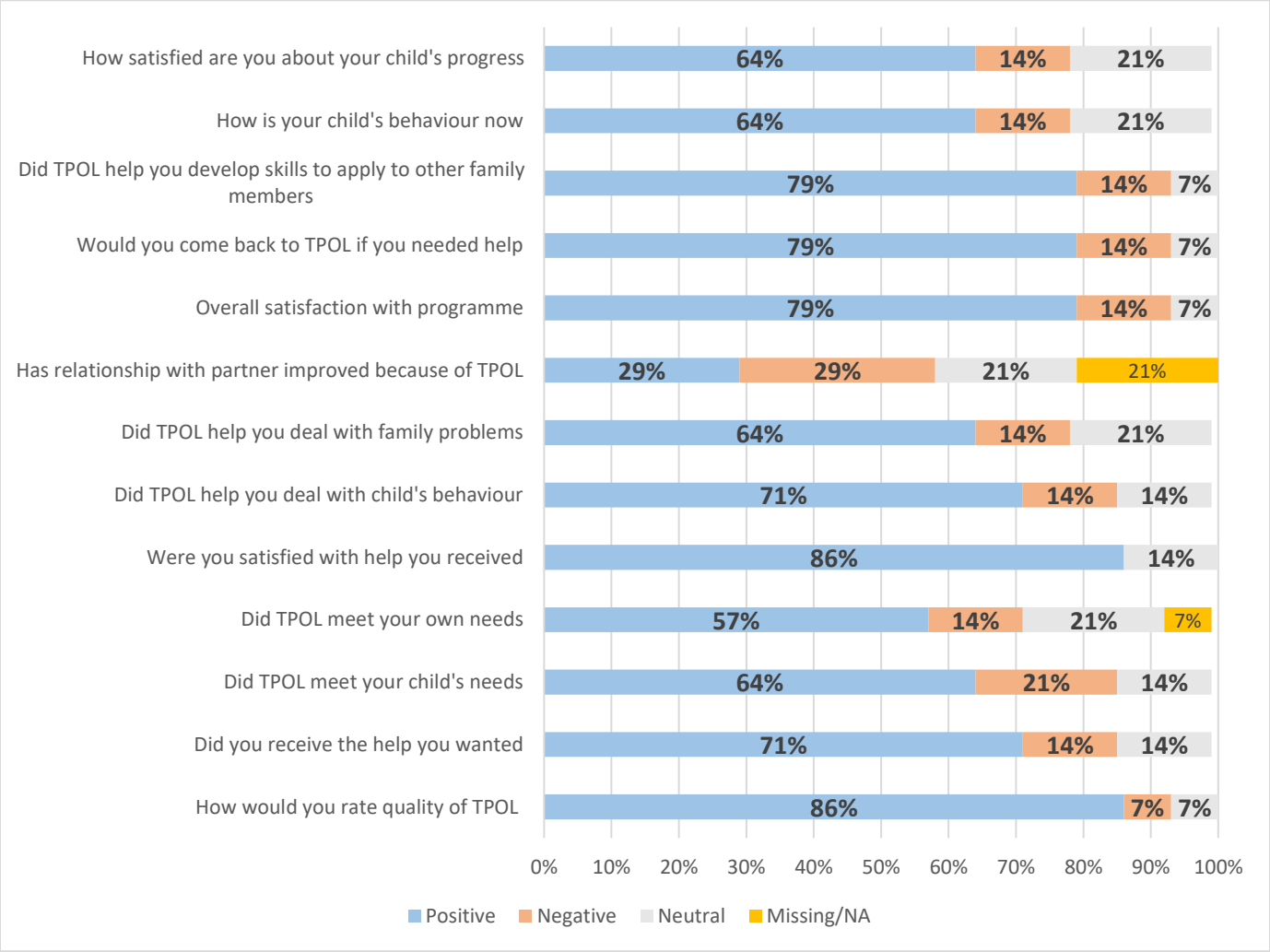

FIGURE 7-2: PARENTS SATISFACTION WITH TPOL (N=14)

The CSQ also provided parents with the opportunity to give written comments about TPOL and eight (57%) parents completed this question. Half of this group specifically mentioned the programme duration as being longer than they would have liked; for example, one parent stated that she would have completed the entire programme if there were four rather than eight modules. As indicated above, one mother stated that the programme was not suitable for their

child as they felt it was more appropriate for parents of younger children. Two parents commented that they would have preferred to complete the measurements electronically and one person stated that they would have liked to have been able to select which modules they wished to complete in their preferred order.

7.5 Intervention effectiveness

An intention-to-treat analysis (ITT) was conducted, whereby data were included for all parents who completed baseline assessments and were subsequently randomly allocated, regardless of whether they commenced or completed the intervention, or completed the follow-up measures. The method used for handling missing data was the last observation (data) carried forward method, which has been used in similar studies (82). To evaluate short-term intervention effects, differences between the intervention and control groups were examined using a series of univariate analyses of covariance (ANCOVAs), with post-intervention scores as dependent variables and pre-assessment data included as covariates, as described earlier in section 4.5. Table 7.4 contains descriptive statistics for both the control and intervention conditions at pre- and post-intervention, as well as unadjusted univariate F values and effect sizes (Cohen's d). Levene's test and normality checks were carried out and the ANCOVA assumptions were met for all analyses.

7.5.1 Primary Outcome

Analysis of the primary outcome variable, the SDQ 'total difficulties' score, revealed a medium effect size (F (1,19) = 3.35, p= .083, d=0.57). However, the univariate tests showed no differences between those assigned to the TPOL group and the controls in terms of any changes in EBD from baseline to post intervention (Table 7.4).

7.5.2 Secondary Outcomes

Analysis of the three parenting styles (laxness, verbosity and over-reactivity) measured using the Parenting Scale, revealed small effect sizes for Verbosity (d=0.29) and Over-reactivity (d=0.32). A medium (non-significant) effect size for Laxness (d=0.66) was also revealed with parents reporting a larger reduction in permissive parenting, from baseline than those in the control group (Table 7.3). A small (non-significant) effect size was also found for the change in parental depression scores (d=0.11). Medium (non-significant) effect sizes were found with regard to parental levels of anxiety (d=0.55) and stress (d=0.70) with parents in the intervention group reporting a larger reduction in both stress and anxiety levels from baseline than those in the control group. Furthermore, medium (non-significant) effect sizes were revealed for parents scores on the Problem score (d=0.50) of the Parent Problem Checklist, with parents in the intervention group reporting a larger reduction in parental arguments over child-rearing issues from baseline than those in the control group. Only a small (non-significant) effect size was found on the Relationship Quality Index (d=0.17) pre and post-intervention between the groups.

TABLE 7-4: INTERVENTION EFFECTS: INTERVENTION AND CONTROL CONDITIONS AT BASELINE AND FOLLOW-UP

Variable	Triple P Online (n=15)				Control (n=7)				ANCOVA Effect size	
	Pre		Post		Pre		Post			
	M	SD	M	SD	M	SD	M	SD	F	d
SDQ	14.93	1.28	12.47	2.37	14.85	1.21	13.86	2.54	3.35ns	0.57
Parenting Scale										
Laxness	3.31	.74	3.16	.69	3.62	.70	3.58	.57	4.74ns	0.66
Over-reactivity	3.46	1.17	2.81	.93	3.44	.47	3.05	.51	1.25ns	0.32
Verbosity	4.10	.85	3.39	.60	4.31	.38	3.25	.33	2.86ns	0.29
DASS-21										
Anxiety	4.80	1.01	3.20	1.26	4.57	.98	4.00	1.63	2.80ns	0.55
Depression	5.33	1.95	3.47	1.60	4.28	2.13	3.71	2.69	1.91ns	0.11
Stress	10.26	3.01	7.73	2.91	10.86	2.79	9.71	2.75	7.17*‡	0.70
	Triple P Online (n=12)				Control (n=4)					
Parent Problem Checklist ±										
Problem	4.42	1.24	3.75	1.05	4.75	1.26	4.25	.96	.44ns	0.50
Extent	31.08	11.91	27.67	13.52	36.00	7.64	30.20	8.26	2.01ns	0.22
Relationship Quality Index ±	31.0	9.03	34.63	6.98	33.75	4.92	33.75	2.06	2.52ns	0.17

M=Mean, SD=Standard Deviation, ANCOVA= Univariate Analysis of Covariance, d=Cohen's d.
Variables significant at * p<0.05, ns =non-significant variables.
±Single parents did not complete the PPC or RQI.
‡ Variable no longer significant after Bonferroni's adjustment was applied.

7.6 Conclusion

The results of this feasibility study indicate that TPOL may be acceptable to Irish parents as most parents felt that the quality of the programme was 'good' or 'excellent'. Although only 50% completed the entire programme, 80% completed at least three modules, which has been shown to be sufficient content (with regard to the Triple P programme) to achieve significant improvements in disruptive child behaviour (83). Furthermore, the majority of parents reported that the programme helped them to deal more effectively with their child's behaviour. A small

number of parents provided additional comments about TPOL, which related mainly to concerns regarding the length of time required to complete the programme and, in one case, the perceived unsuitability of the programme for older children. Most parents reported that they would return to TPOL if they needed help in the future and reported that the programme had helped them develop skills that could be applied to other members of their family.

The analysis of the primary outcome variable, the SDQ, revealed no significant difference between control and intervention group despite a moderate effect size being reported. For the secondary outcome variables, which measured parenting skills, mood, and family functioning, small to medium (non-significant) effect sizes were found. These non-significant results are unsurprising considering that the study was clearly underpowered to detect significant results. These findings, along with results from studies one and two, will be discussed in detail in the final chapter.

Chapter 8 Discussion

The aims of this research were twofold: (1) to investigate the prevalence of EBD in children and young adolescents and to explore associated risk factors; and (2) to assess the feasibility of implementing an online parenting programme in Ireland to reduce EBD in children. This thesis comprised three main studies – two cohort studies using Growing Up in Ireland data, and a feasibility study Triple P Online. Thus, the study generated findings on: (a) the prevalence of EBD in children and in young adolescents in Ireland; (b) the risk factors associated with EBD in each cohort; and (c) the feasibility of implementing an online parenting intervention in an Irish context. In this final chapter, the findings from both cohort studies and the feasibility study are discussed in the context of previous research, their strengths and limitations are presented, the implications of the findings for policy and practice are examined and conclusions drawn along with recommendations for further research.

8.1 Study 1: Identifying early indicators of Emotional and Behavioural Difficulties in five-year-old children

The results of Study 1 indicate that almost one in eight (12%) five-year-old children in Ireland have EBD. The results suggest that a range of child and family risk factors in early childhood increase the risk of EBD in five-year-old children in Ireland. Overall, the most statistically significant predictor of EBD in five-year-old children was the presence of EBD at the age of three. This finding was echoed in a large US longitudinal study conducted by Edwards and Hans (29). They assessed infants and their primary caregivers (n=412) over three time points - when the child was five months, two and a half years and five-years-old. They demonstrated that half the

infants in the study who had behaviour problems at age two and a half years continued to have such problems at age five. This is an important point as it demonstrates that EBD may not be a transient issue and thus the need for targeted intervention and prevention in the earliest years is essential in order to reduce EBD in young children; as without such intervention, the success rates in tackling such problems diminish over time. Furthermore, the findings from Study 1 show that having a difficult temperament as a baby can predict early childhood EBD. In general, children with difficult temperaments are more sensitive to both positive and negative environmental influences. Thus, negative parenting affects these children more, while at the same time they benefit more from warm and sensitive parenting practices (203). Therefore, interventions that help parents of young infants (especially with a difficult temperament) develop healthy attachments, may be particularly effective in preventing EBD in early childhood.

The second most significant predictor of EBD in early childhood was the mother's use of harsh discipline when the child was three-years-old. Significant associations with other negative maternal parenting practices, such as insecure attachment, inconsistent parenting and EBD in early childhood, were also found in our study. These findings are consistent with a number of studies undertaken in the US (30), the UK (113, 115) and Australia (11, 114) which, likewise have found that negative parenting practices, most notably harsh discipline, are leading predictors of EBD in young children. Furthermore, it has been suggested that continuities in parenting practices across generations may exert a significant influence on parenting style, practices and strategies (135, 136). Indeed, there is growing evidence that the style of parenting in one generation influences parental behaviour in the next and especially with regard to parental

harshness/hostility (137). Therefore, early evidence-based intervention and prevention programmes (e.g, parenting interventions) should help to interrupt the inter-generational continuity of harsh parenting. For example, interventions such as the Incredible Years and Triple P parenting programmes are designed to help parents develop warm sensitive and supportive relationships with their children, while at the same time providing them with the skills to identify problem behaviours and use positive reinforcement, such as rewards, to encourage desirable behaviour.

Maternal stress was identified as the third most significant predictor of EBD in early childhood in Study 1. A number of studies conducted elsewhere, have reported similar findings (48-50). However, Tharner *et al*. (39), in their population-based cohort study of infant attachment and parenting (n=606) in the Netherlands, revealed that parenting stress was related to more aggression and attention problem behaviours in 'insecurely attached' children, but not in children who had formed secure parent-child attachments. This would suggest that attachment security in infancy buffers the influence of parenting stress on childhood EBD (39) thereby reinforcing the need for intervention in the earliest years.

The presence of a speech and language problem, between the ages of three and five years was significantly associated with EBD at five years. This is an interesting and important finding and one which has rarely been reported elsewhere; for example, one study in Australia found that children with speech and language difficulties were significantly more likely to have emotional problems than children without such difficulties (11). It has been suggested that children with

speech difficulties are at increased risk of EBD due to feeling misunderstood by family and peers which, in turn, may lead to problem behaviour which disrupts family and peer relationships, such as acting out or avoidance (204). The greater risk of EBD in children with speech problems, requires further examination to establish the developmental trajectories of this cohort.

Consistent with findings widely reported in the literature, our study also suggests that boys are more likely than girls to have EBD at five years (30, 31). Research would suggest that boys have more difficulty controlling aggression than girls in early childhood (205, 206). Gender differences in the prevalence of physical aggression have also been reported in children as young as two years (205). Indeed, Baillargeon *et al.* point out, that these differences may be socially driven, with the effects of differing gender socialisation practices on early aggressive behaviour, evident before the child's second year of life (205). This would suggest a need for research on intervention and prevention programmes in the earliest years, to perhaps assess and consider the effect of gender-socialisation practices.

A significant association between maternal physical illness and EBD in early childhood also emerged from Study 1. This finding is supported by Sieh at al. (47) who conducted a meta-analysis comparing problem behaviour in children of a chronically ill parent with children whose parents were not ill (47). They found that the former were at a significantly higher risk of EBD; they also found that this was most significant in early childhood. However, longitudinal studies on the impact of parental physical illness on the mental health and well-being of young children

are limited. Thus, the current study findings represent an important addition to the literature in this regard, particularly in a European context.

The findings from Study 1 indicate that exposure to violence within the family significantly increases the risk of EBD in five-year-old children. A large number of studies have found that exposure to domestic violence has strong adverse outcomes for children, resulting in increased levels of aggression, depression, anger, and anxiety (55, 57). For example, Evans *et al.* conducted a meta-analysis to examine the relationship between childhood exposure to domestic violence and children's outcomes (55). They examined 60 studies and found that there was a moderate association between exposure to domestic violence and EBD in children. Likewise, Huang *et al.* revealed that children (n=5,000) who were exposed to domestic violence when they were aged one, had a significantly greater risk of developing EBD at age five than children who were not exposed to such violence (57). However, the findings of other studies suggest that it is not the child's exposure to violence *per se* that increases their risk of EBD, but rather the negative impact of domestic violence on parental mental health (59, 115, 128). The findings reported here from Study 1, provides convincing evidence to indicate that growing up in a family where conflict is present, has a detrimental impact on the mental health of young children.

Study 1, for the first time, established the child and family risk factors associated with EBD in early childhood in an Irish context, using longitudinal data. This provided the impetus to explore this area further by examining the risk factors associated with EBD in older children. These were examined in Study 2, the results of which are discussed below.

8.2 Study 2: Identifying early indicators of Emotional and Behavioural Difficulties in 13-year-old children

The results of Study 2 suggest that more than 12% of 13-year-old children in Ireland have EBD. This figure is similar to the prevalence rates reported in other longitudinal studies conducted in Northern Ireland and Scotland and using the same outcome measure (SDQ). While the overall prevalence of EBD is similar in Studies 1 and 2, it differs between boys and girls. In Study 1, there was a significant difference in the prevalence rate of EBD at age five in boys (13.7%) and girls (9.1%). However, in the older cohort (13 years), the gap between boys and girls had diminished and no significant differences were found, with 13-year-old boys having a prevalence rate of 12.9% compared to 11.7% in girls of the same age. Indeed, numerous studies have reported a higher prevalence of EBD in boys in early childhood (30, 31, 60) with the prevalence rate amongst girls, increasing during adolescence and approaching that of boys during this period (13). Emotional difficulties tend to increase among girls when they grow older, whereas conduct problems decrease over time among boys (110).

On a related gender dimension, the findings from Study 2 indicate that being bullied in childhood can lead to EBD in adolescent girls, but not boys. Numerous studies have reported a significant association between bullying and mental health problems in adolescents (34-36). Notably, Kelleher *et al*. demonstrated an interesting dose-response relationship between childhood bullying and psychotic experiences, with the odds of psychotic experiences increasing in line with increasing levels of bullying (36). Lataster *et al.* reported similar findings in a cohort of 13-14 year

old secondary school children in the Netherlands (n=1,290) (107). Interestingly, neither study looked at the impact of bullying on girls and boys separately. However, gender differences in this respect, were addressed by Fleming and Jacobsen (2010) who examined the prevalence of bully victimisation in school children in 19 low- and middle-income countries. Similar to the findings reported in the current study, they found that girls who were bullied in the past month were significantly more likely than boys who were bullied, to report depressive feelings (35). Given that bullying has such a profound effect on the mental health of adolescents, more research is required to help us understand how and why bullying differentially affects the mental health of boys and girls. Additionally, more longitudinal analysis is needed to explore the impact of cyber bullying on the mental health of children and adolescents, as this has not been addressed in this study, or indeed, in many other longitudinal studies. There is also a clear need to identify appropriate interventions to prevent and reduce bullying behaviour in schools, as school intervention policies have shown limited success (207, 208).

Girls in the current study were also found to be at a higher risk of EBD at 13 years if they suffered from low self-esteem when aged nine. In the Dunedin Multidisciplinary Health and Development Study (n=980) in New Zealand, low self-esteem in childhood was also found to have a negative impact on adolescent mental health (209). This was a large longitudinal study, which followed the same cohort over nine periods (from birth to 26 years). They found that children with low self- esteem were 1.26 times more likely to suffer from depression and 1.60 times more likely to develop anxiety disorder as they got older, than children with high self-esteem. Further research

on the impact self-esteem on adolescent mental health is needed to address these gender differences. Furthermore, evidence-based programmes such as the Incredible Years Teacher Classroom Management (TCM) Programme (79) and the FRIENDS Programme (210) - both of which promote resilience and social and emotional competence in children and young people - should be considered for implementation in Irish schools.

This study also revealed that having EBD and/or a specific learning difficulty (SLD) at 9 years, was a significant predictor of EBD at 13 years. This is consistent with a wide range of studies which have described the co-existence of SLD and EBD in children and adolescents (32, 33). For example, in a Norwegian study Knivsberg and Andreassen (2008) stated that significantly more emotional, behavioural and attention problems were present in children with severe dyslexia than a matched control group, based on parent, child and teacher reports (33). Moreover, Willcutt and Pennington (2000), in a study in Colorado, revealed that sets of twins with reading disabilities (n=209) exhibited significantly more EBDs than controls (n=192). Furthermore, it has been suggested that the co-existence of learning difficulties and ADHD in childhood and adolescence, is a leading predictor of mental health disorders (e.g. anxiety and depression) in adolescence and adulthood (105). For this reason, some parenting interventions, such as Triple P, the Incredible Years parenting programme and Parents Plus, have been tailored and designed in ways that provide extra support for parents of children with specific learning difficulties, such as ADHD.

The findings from Study 2 also indicate that having a mother who had depression when the child was nine-years-old, was a significant predictor of EBD in adolescents. Indeed, children of parents who are depressed, are reported to be three-to-four times more likely to develop EBD than children whose parents are not depressed (211). One explanation for this is that mothers who suffer from depression may (often unintentionally) employ less effective parenting practices, which can lead to aggressive behaviour in their children during the adolescent years (41, 212). Additionally, children may find interactions with their mothers (who are depressed) to be highly frustrating, and these mothers, in turn, may not have the capacity to deal effectively with their children's responses or EBD (213). However, while many children and adolescents with a depressed parent do experience mental health difficulties, others exhibit no difficulties at all (9, 117). This was examined in two recent UK studies that investigated the mental health outcomes of adolescents with depressed parents, which found that parental warmth, support and responsiveness were strongly associated with adolescent mental health resilience (9, 117). Importantly, there is a significant lack of family-focused practice in mental health services in Ireland (116). The findings reported from the current study, highlight the importance of tackling parental mental illness at the family level and using appropriate evidence-based interventions, such as Family Talk, (116), to help reduce the potentially harmful impact on children's mental health and well-being. This point will be re-visited later in Section 8.6.

In the current study – and perhaps unsurprisingly - we also found a significant relationship between drug addiction or alcoholism within the family and EBD at 13 years. This result supports some findings from elsewhere (123, 124, 126). For example, Park & Schepp (2015), in their

systematic review, reported that adolescent children of alcoholics were significantly more likely to misuse drugs, be involved in antisocial behaviour and have high-risk thoughts and feelings, when compared to children of non-alcoholics. Interestingly, however, they also reported that if children had a secure relationship with *one parent*, this could offset the negative effects of having an (other) alcoholic parent (126). Therefore, positive parenting appears to mediate some negative childhood experiences. The ability to follow a large cohort of children longitudinally from childhood to adolescence is a key strength of the current study and adds to our understanding of the increased risk of EBD among the children of alcoholics, in particular boys. Few studies have however, looked at how alcoholism or alcohol dependency in parents affect the mental health of boys and girls separately, thereby indicating a need for more research in this area.

Studies 1 and 2 assessed the prevalence and risk factors associated with EBD in the context of a longitudinal analysis. The final element of the research - Study Three - was conducted to test the feasibility of an online parenting programme in Ireland, aimed at reducing EBD.

8.3 Testing the feasibility of an online parenting intervention (TPOL) for improving child mental health

The primary aim of Study 3 was to investigate the acceptability and feasibility of TPOL in an Irish context. Although the attrition rate from the feasibility study was low (N=1/15), only 50% of participants (N=7/14) completed the entire programme. Nevertheless, it should be noted that 80% completed at least three modules, which has been shown to be sufficient content to

achieve significant improvements in disruptive child behaviour (83). Furthermore, high scores on the Client Satisfaction Questionnaire (CSQ) (mean=70.57) indicate that TPOL was acceptable to the parents who took part in this study. This was slightly higher than was found in an evaluation of TPOL in Australia (mean=68.55) (3), but lower than an evaluation of group Triple P previously conducted in Ireland (144) (mean=80.10). Both studies also used the CSQ to assess parental satisfaction. In the current study, parents reported that they were satisfied with the quality of the programme; they also indicated that they would return to TPOL if they needed help in the future and that the programme had helped them develop skills that could be applied to other members of their family.

Despite this positive feedback, as stated earlier, half of the parents did not complete the full programme. Problems with completion of web–based programmes have been reported in other studies (83, 96, 145). For example, a Welsh feasibility study conducted by Owen and Hutchings (2017) – and based on the *COPING* web-based programme (COnfident Parent INternet Guide) parenting programme – found that while 90% completed Chapter One, only 15% completed the entire ten chapters (145). As in the case of TPOL, the *COPING* parent programme is designed to support parents in establishing positive relationships with children and promoting their children's well being and development (145). The reasons for non-completion in this study were similar to those reported here most notably related to work and family pressures. Other reasons provided by the Welsh participants included: not remembering to complete the programme and not having access to a PC or laptop at home. The authors concluded that the completion of the

programme could possibly be improved with more prompts from the researcher during programme delivery.

The overall completion rate for the current RCT was similar to that found by Sanders *et al*. (2012) when evaluating TPOL in Australia (83). They found that 95% of parents completed module one of TPOL but only 47% completed all eight sessions; no reasons were provided for the low completion rate in their study. In the present study, during the 12-week intervention period, the researcher contacted parents by either email or by phone if they had not logged onto the programme for three weeks. The use of such periodic prompts has been found to be useful in some health promotion interventions; for example, Fry and Neff (2009), in their systematic review of the use of reminders in health promotion interventions, reported that 11 out of 19 studies reported positive findings in this respect (214). Therefore, in future studies, the regularity of prompts could be increased to every week to help to remind parents to complete more modules, although other, as yet unidentified factors (e.g. the type of prompt), may also be at play.

Some parents in the current study, commented that the programme took too long to complete, with each module taking at least 30 minutes and some taking over an hour to finish. Triple P have since developed a shorter version of TPOL (TPOL Brief) as they too have reported low programme completion rates (215). TPOL Brief has been evaluated once in Australia (n=200) and was found to be effective in reducing child problem behaviour and parenting practices. Australian parents also reported high satisfaction scores on the CSQ for this programme, which

suggests that it may be worth piloting TPOL Brief in an Irish context. However, the findings from the above study must be interpreted with caution given the involvement of the programme developer; more independent replications are required before we can verify its effectiveness in other settings.

In Study 3, a reporting tool built into TPOL, allowed the researcher to track and record the number of modules completed by each participant. This tool could be utilised further in a larger pilot study to identify which factors (for e.g. age, education level, number of children) are associated with module completion. This could not be examined in the current study due to the small sample size. With regard to data collection, the baseline and follow-up questionnaires were administered by means of a postal survey. However, some parents reported that they would have preferred to complete the measures electronically. In future studies, perhaps assessment measures could be used and completed by parents online, which may be more convenient for both the researcher and participants.

The recruitment of participants for the current study was extremely challenging, for a number of reasons. The planned sample size was for 36 parents (24 to the intervention group and 12 to the control group). The recruitment strategy involved advertising initially on a parenting forum and subsequently contacting principals of primary schools in Dublin (two schools were situated in disadvantaged areas and three were situated in affluent areas). The principals subsequently passed on details of the study to the parents of children in their schools. Advertising on the parenting forum proved to be a more successful recruitment strategy than advertising through

the schools, with 59% (N=13) and 23% (N=5) recruited from each respectively. A further four parents (18%) were recruited by word of mouth.

There are a number of important lessons to be learned here from the recruitment challenges experienced in this study. For example, the researcher was only able to make contact with parents once they had read the advertisement and study details. Future studies could consider employing one or more Public Health Nurse(s) who work closely with families (and who would be appropriately informed about TPOL), to help recruit parents. This would ensure that parents, who are most in need or harder to reach, would be given an opportunity to complete TPOL. The incentive of a €25 gift voucher for parents appeared to have had a positive impact on the current study in terms of the retention rate; in order to receive the voucher, parents needed to complete the follow-up questionnaires and parents were reminded of this throughout the study. Incentives were also shown to be effective in a German study (N=197) conducted by Henrichs (2006). They investigated the impact of monetary incentives on the recruitment rate to a parenting programme and found that, in general, payment was an effective strategy to increase the recruitment rate and initial programme attendance (216). However, only a small number (5%) of parents dropped out of the programme in the present study, so the impact of payment on retention could not be assessed.

Although the aim of Study 1 was primarily to evaluate the feasibility and acceptability of TPOL in an Irish setting, the effectiveness of the programme was also evaluated but only in a limited sense due to the small sample size. Although effect sizes of the magnitude of d=0.70 (for DASS-

21 Stress) were found, none of the findings reached statistical significance as would be expected due to insufficient power to detect differences between the groups. It should be noted that the change in SDQ score for the intervention group was greater than that of the control pre- versus post-assessment. Similarly, the hypothesis that parents receiving TPOL would report improvements in their parenting, was supported by a positive change in the laxness score (permissive discipline) on the Parenting Scale. The findings in relation to parental conflict in child rearing suggest some positive, albeit non-significant, change in the intervention group, although the effect size with regard to the quality of a couple's relationship was small (d=0.17). However, for both of these measures, the sample was reduced even further - to 16 - as some participants were lone parents for whom these measures were not relevant.

There were no large differences between groups with regard to symptoms of depression, but there was a medium to large effect size reported for symptoms of anxiety and stress. Overall, the results from this study provide some tentative evidence for the effectiveness of TPOL, with the largest effects shown in regard to reductions in parental stress. It is difficult, however, to contextualise or benchmark these results in relation to other studies that have evaluated TPOL, as only two similar RCTs have been conducted in New Zealand and Australia (83, 163). Although both studies reported significant moderate to large effects with regard to improvements in parenting practices and children's problem behaviour, both included programme developer involvement, which may have biased the results.

8.4 Study evaluation

8.4.1 Strengths

The research reported here had a number of key strengths. Studies 1 and 2 were based on large representative samples of parents who were interviewed over two to three time points when their children were in either early childhood or later childhood. The studies examined a wide range of potential child, maternal, paternal and family risk factors, using a number of psychometrically robust measures. Fathers are often excluded from parenting studies, but both mothers and fathers (77% of fathers in both studies) were interviewed and characteristics of both parents were examined. Another major strength of the studies lies in their size and detailed measurement of factors linked to children's emotions and behaviours. Both studies are the first to conduct longitudinal analyses of maternal, paternal and child risk factors associated with EBD in early and later childhood in an Irish context. The use of evidence from two large nationally representative datasets means that the results can be generalised to the wider general population, thereby highlighting the risk factors associated with EBD in early and later childhood. This information should be of considerable interest to practitioners and NGOs who work with parents and children, as well as schools, policy makers, researchers and the general public.

Furthermore, Study 3 was the first of its kind in Ireland – and one of the few internationally - to test the feasibility and acceptability of an online parenting programme (without the assistance of a facilitator). The findings are based on a range of validated measures including: parent-report of child behaviour; self-report of parenting practices; measures of parental mental health and parental conflict around child-rearing issues; and a validated client satisfaction questionnaire.

Another strength of the study was TPOL's ability to keep track of user adherence. It had a number of built-in functions, which allowed the researcher to monitor the number of times a parent logged onto the programme, the number of modules each parent completed and the overall length of time it took to complete the programme. The findings from this study represent a useful addition to the literature on online parenting programmes and suggest that it may be worth exploring further the potential of TPOL – and especially the shorter version - as a new/alternative form of parent training in Ireland and elsewhere.

8.4.2 Limitations

The research also had a number of weaknesses. For studies one and two, attrition was problematic which is a common concern in longitudinal studies. Although the SDQ, which was used to assess EBD, is a reliable and validated measure, it is not a diagnostic tool and, therefore, it must be noted that no diagnostic/clinical assessment was undertaken on the children in either study. In addition, the SDQ reported in the studies was completed by parents only; therefore, there may have been some bias as to how they viewed their child's behaviour. Further research could, for example, undertake observational work with both parents and their children (82, 145) and/or compare teacher and parent reported SDQ scores for five-year-old children in order to establish a more holistic and potentially less biased perspective on child behaviour. Furthermore, emotional (internalising difficulties) and behavioural (externalising difficulties) difficulties could have been analysed separately using the SDQ, but this was not examined here as the power of the logistic regression models would have been reduced due to small numbers within the subgroups. In future studies, the risk factors associated with emotional and behavioural

difficulties could be examined separately and particularly for adolescents. Finally, it was surprising that maternal depression was not found to be a significant predictor of EBD in early childhood, given the fact that several studies reported this as a key indicator of EBD in children (42-45). This may be explained by the fact that a subjective tool (CES-D) was used to measure depression as opposed to a diagnostic tool. The results may have been different if a diagnostic tool was used.

Study Three also had a number of weaknesses, firstly the researcher was not blinded to group allocation, this was not possible because the researcher needed to provide participants with log in details for the online programme and to assist with any technical problems. As suggested by Schulz *et al*. without effective blinding, i.e. if group assignment is known by the researcher, bias can be introduced because extra attention may be given to the intervention group (intended or otherwise) (217). Furthermore, the feasibility study was small with only 22 parents consenting to participate. Perhaps more creative methods could have been used to reach a larger number of parents. For example, McGilloway *et al*. (82) in their albeit larger study, recruited 149 parents using public health service waiting lists, local schools and community-based agencies, while Sanders *et al.* (83) recruited 116 families by advertising in the mass media, in childcare settings, in schools and on a number of parenting forums. Although the retention rate was high in Study 3, adherence to the programme was low, with only half of the parents completing the entire programme; a larger trial should explore ways of improving programme engagement, possibly through additional reminder emails and/or phone calls and use of incentives. A future trial could also compare the effectiveness of TPOL with the new recently developed TPOL (Brief), a shorter

version of TPOL. Additionally, some parents reported that they would have preferred to complete the measures electronically. In a future trial, these could be completed in an electronic format, which would be more convenient to both researcher and participant and more attractive to a digitally literate generation of parents.

Another limitation of the study was the over-representation of parents who were highly educated and more advantaged, with 73% having attained a third level qualification compared to 45% in the general population. This would have introduced some bias in the study in the sense that this group may have been relatively 'high functioning' when compared to a less advantaged or more representative cohort and there may have been less scope for improvement, therefore, for change on some of the measures used. The overall feasibility and acceptability of the programme may also have been affected if the trial had included less well-educated parents. Lastly, due to resource constraint, no qualitative data were captured in the feasibility study; this would have been helpful in exploring, amongst other things, participants detailed views, their reasons for non-participation and the perceived usefulness of the programme.

8.5 Implications for policy and practice

As is evident from this research, EBD can emerge in early childhood and risk factors can be identified as early as infancy. The findings from Studies 1 and 2 provide convincing evidence to suggest that interventions designed to treat these problems (e.g., parenting programmes and other parenting supports) should be implemented as early as possible in children's lives. Indeed, the ENRICH (**E**valuatio**N** of w**R**aparound in **I**reland for **CH**ildren and families) research programme

in Ireland (218) is testing the effectiveness and cost-effectiveness of the Incredible Years Parent and Baby programme which is being delivered (as part of a larger wraparound-inspired service model) by Public Health Nurses to parents of young infants (e.g., 8-10 weeks) in an attempt to help them develop healthy attachments and behaviours from the outset (see www.cmhcr.eu for further information). Little is known about the effectiveness of such early interventions, but the findings reported here suggest that there may be merit in targeting potentially vulnerable sub-groups early (e.g., through the delivery of evidence-based parenting programmes) where there is evidence of, for example, parental conflict, parental stress and parental ill-health. The findings further suggest that it is important that parents who have children with a long-term illness or disability are given sufficient information and advice on how to manage their children's emotions and behaviour, as this aspect of well-being may be inadvertently neglected due to more pressing physical health issues. It is also important that mothers who have a long-term illness themselves be given extra supports with regard to helping them to better manage their child's emotional and behavioural well-being. The greater risk of EBD in children with speech problems is particularly important and relevant for Speech and Language Therapists, Public Health Nurses and others who may not immediately link these kinds of difficulties to aspects of behaviour and emotional well-being.

Also evident from this research was the impact of maternal depression on children's mental health, and in particular girls. Indeed, the PRIMERA (**P**romoting **R**esearch and **I**nnovation in **M**ental h**E**alth se**R**vices for f**A**milies) research programme is investigating (for the first time in Ireland) family-focused services and supports for parents with a diagnosed mental illness and their children (5-18yrs) (see www.cmhcr.eu for further information). Early findings highlight a

significant lack of family-focused practice in mental health services in Ireland (116). However, the PRIMERA research team are working with services in 12 sites across Ireland to help them implement a new intervention called Family Talk, which will subsequently be evaluated. This project is already raising awareness around the need for mental health services to adopt a 'think family' approach in the Republic of Ireland.

Children of parents who suffer from alcohol or drug addiction are also at increased risk of EBD according to our findings. Parenting programmes could be introduced as part of the treatment and recovery plan for parents seeking help for their addiction, as these would not only help the parent recover from addiction but would simultaneously improve the mental well-being of their children. The Parents under Pressure (PuP) programme is an example of such an intervention (219). The PuP aims to improve family functioning and child outcomes by supporting parents who are, or who have been, drug or alcohol dependent (146). Evaluations of the programme in Ireland (146) and the UK (219, 220) have shown promising results.

Furthermore, our findings suggest that bullying has a negative effect on children's mental health and most notably girls. Encouragingly, Kelleher *et al.* found that the cessation of bullying leads to an improvement in the mental health of the victim (109). This suggests that evidence-based interventions to prevent and stop bullying could be effective in reducing EBD in adolescence. The KiVa anti-bullying programme, developed in Finland, is an example of an evidence-based programme aimed at preventing and tackling cases of bullying. It has been evaluated in Finland (221), and the in UK (through a pilot study) (222) with positive results. A programme such as this

could be evaluated and possibly implemented in an Irish context in order to reduce and prevent bullying.

Finally, the findings indicate that it may be feasible to apply non-traditional parenting interventions, such as TPOL, to an Irish setting. Although group and individual based parenting programmes will always be needed, online interventions may also have their place. These kinds of programmes can reach a wider population and thus can make a positive contribution to the existing parenting interventions that are already available in Ireland. The results of our feasibility study show that a larger scale pilot RCT is warranted to test the effectiveness and cost-effectiveness of TPOL and possibly TPOL (Brief), as this format may provide a potential cost-effective parenting intervention that could be made available to a large number of interested parents.

8.6 Recommendations arising from this research

This research generated a number of recommendations in terms of directions for future research. These are outlined below:

- Vulnerable sub-groups - where there is evidence of, for example, parental conflict, parental stress, maternal depression and parental ill health - should be targeted early (e.g., through the delivery of evidence-based parenting programmes);
- Parents who have difficulty forming a close relationship with their baby should be provided with parenting supports as early as possible in their child's development;

- Parents of children who are at risk of EBD due to a long-term illness or disability or a speech problem, for example, should be given information and advice on how to manage their children's emotions and behaviour;
- The greater risk of EBD in children with an illness or disability or indeed a speech problem, requires further examination to establish the developmental trajectories of this cohort.
- More family-focused interventions should be introduced for vulnerable families where one or more parents have a mental illness, in order to improve both parent and child mental health, coping and resilience;
- Parenting programmes could be introduced as part of the treatment and recovery plan for parents seeking help for addiction;
- More evidence-based interventions should be identified to prevent and stop bullying (including cyber-bullying);
- More longitudinal analysis is needed to help us understand the impact of cyber bullying on the mental health of children and adolescents;
- Evidence-based programmes which promote resilience and social and emotional competence in children and young people, should be considered for implementation in Irish schools;
- Children with multiple risk factors should be identified and provided with targeted interventions aimed at meeting their specific requirements;

- More longitudinal research should be conducted into how specific risk factors such as, bullying, maternal depression and alcoholism/drug addiction impact on the mental health of boys and girls separately;
- Non-traditional parenting interventions such as online parenting programmes, should be investigated further to test their effectiveness and cost-effectiveness;
- A pilot study comparing TPOL and TPOL (Brief) should be conducted to examine the effectiveness of both programmes in achieving benefits for parents and their children;
- Any future trials or studies on TPOL or TPOL (Brief) should elicit qualitative data from parents after completion (e.g. on barriers and facilitators to programme delivery and module completion).

8.7 Conclusion

This research for the first time, identified the risk factors associated with EBD in childhood (early childhood and adolescents) taking into account, the perspective of both children and family using longitudinal data. The first two studies identified a number of areas for future research. A significant association between speech and language difficulties in early childhood and EBD at five years was identified. This is particularly important and relevant for Speech and Language Therapists, Public Health Nurses and others who may not immediately link these kinds of difficulties to aspects of behaviour and emotional well-being. The greater risk of EBD in children with speech problems, requires further examination to establish the developmental trajectories of this cohort. Furthermore, this research identified a need for more longitudinal research into how specific risk factors such as, bullying, maternal depression and alcoholism/drug addiction

impact on the mental health of adolescent boys and girls separately. Moreover, this research illustrates the value of longitudinal data in providing a useful means or model of identifying children with multiple risk factors, thereby providing some insights into how best we might intervene early to support them and their families.

This is the first study to demonstrate that it is feasible to apply non-traditional parenting interventions, such as TPOL, to an Irish setting. Furthermore, it is the first European study to test the feasibility of implementing TPOL. This research, therefore, represents a useful addition to the national and international literature on online parenting programmes and suggests that it may be worth exploring further the potential of online parenting programmes. The results suggest that shorter online parenting programmes may be worth investigating further, either on their own or in conjunction with a longer version to examine their effectiveness in achieving benefits for parents and their children.

The findings raise some important issues including, firstly, the need for health and social services and schools to focus more on the mental health and well-being of children (particularly children with an existing EBD) as this may not be a transient issue. Secondly, there is a need for health and social care professionals, as well as teachers, to be more aware of how parenting practices, parental stress, maternal depression and issues such as bullying, low self-esteem, learning difficulties and chronic illness/disability, can affect the mental health and well-being of young children and adolescence. Indeed, Public Health Nurses could incorporate parent training into their routine practice during, for example, childhood developmental check-ups (as in the areas

included in the ENRICH research programme). Thirdly, there is a need for more research on early intervention strategies or programmes to help reduce or prevent EBD in childhood in order to prevent the numerous negative outcomes that can materialise if these are left untreated. Finally, in view of the 'digital era', more innovative parenting interventions need to be investigated, focusing in particular on the benefits of online strategies to improve parenting. The results from the feasibility study reported here, provides some interesting findings that could help support future research and, in particular, a larger RCT and economic appraisal to test the effectiveness and cost-effectiveness respectively of the TPOL. More independent research into TPOL both nationally and internationally, is also required before it can be recommended to Irish parents. Nevertheless, TPOL does provide an opportunity to bring parenting programmes to the wider population at a relatively low cost (€80 per parent) and in a format, that requires very little technical support. Overall, the research reported here, has demonstrated that families urgently require access to targeted early intervention and prevention programmes in order to prevent and reduce EBD in children and adolescents.

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Appendices

Appendix 1: Family income

To make meaningful comparisons across families in terms of their disposable income, household size and composition (number of adults and children) were taken into account to create an 'equivalised' family income. To do this, the number of 'equivalised' adult members who were resident in the household was calculated, by assigning a weight of 1.0 to the first adult, 0.66 to all subsequent adults (and children over 14 years) and 0.33 to each child (aged 14 years or less). The total number of adult equivalents was then divided into the household's total disposable income to give the household's equivalised disposable income. The families were then divided into five equally sized groups, from highest to lowest in terms of their equivalised family income. Each group (or quintile) contains 20 per cent of five-year-olds and their families. The lowest family income quintile refers to the 20 per cent of families at the bottom of the equivalised income distribution. The second lowest income group includes the families in the next 20 per cent of the income distribution and so on, up to the top income quintile, which contains the 20 per cent of families with the highest equivalised income. For the purpose of this study, the five categories were re-classified into two categories. The two lowest income quintiles were classified as low-income families, while the other three categories were classified as mid to high-income families (Thornton et al., 2013).

Appendix 2: Re-weighting of GUI Data

The sample weights for the first phase of the nine-month cohort of *Growing Up in Ireland* were constructed by adjusting the distribution of the sample to known population figures. The population distributions were derived from two sources. The first was special tabulations prepared by the Central Statistics Office detailing the number and characteristics of infants (aged less than one year old) and their families. These were extracted from the 2006 Census of Population, the most up-to-date and comprehensive source of information on the distribution of children in Ireland. Given the way the information is recorded in the Census of Population, the breakdown of infants according to their characteristics is based on those aged less than one year. It is not possible to extract figures in respect of those aged nine months of age on the night of the census. There are likely to be, at most, minimal differences in the structural composition of infants aged less than one year as compared with those aged nine-months (Thornton et al., 2013).

The second source was the Child Benefit Register from which the sample was drawn. The 73,662 children born in calendar year 2008 were taken as the population to which the sample was statistically weighted and grossed. This provided the total figure to which the grossed sample was calibrated. The system used for generating the sample weights was based on a minimum information loss algorithm, which ensured that the distribution of cases in the completed sample matched a set of control totals for the population. It is based on an iterative approach to the fitting of column marginals from the completed sample to those of the population as a whole.

The child was the unit used in the weighting system. The characteristics of their family were assigned to each child in the sample. Eleven main characteristics were used in the generation of the weights and grossing factors, as outlined and defined below. Variables 1 to 8 were derived from the 2006 Census of Population, and variables 9 to 11 from the Child Benefit Register (Thornton et al., 2013).

1. Family Structure – 12 categories based on lone or two-parent family combined with the number of persons (not children) in the family unit. This gives a classification based on cohabiting couple, married couple and one-parent families, along with the number of persons in their family.

2. Mother's Age – five categories of mother's age, ranging from '25 years or less' to '41 years or more'.

3. Mother's Principal Economic Status (PES) – five categories of mother's work situation, ranging from 'working for payment or profit' to 'looking after the home'.

4. Father's Principal Economic Status (PES) – six categories of father's work situation, ranging from 'working for payment or profit' to 'father not resident'.

5. Family's Social Class – seven categories of family's social class ranging from 'professional workers' to 'family validly has no class code'. Mother and father's social class were derived from current or most recent occupation (if currently unemployed or retired). A category was included for those who validly do not have a social class classification because they have never worked outside the home. When the Social Class of father and mother have been assigned, family social

class is then based on the higher of the two. This is a standard way to assign collective family social class and is referred to as the ‘dominance’ criterion.

6. Mother's Education – 13 categories of mother’s highest level of educational attainment ranging from ‘no formal education’ to ‘doctorate’.

7. Household Tenure – five categories of the household’s tenure of their accommodation, ranging from ‘owner occupier, with or without a loan’ to ‘occupied free of rent’.

8. Region / Child's Gender – 16 categories summarising the geographical location of the child, with separate categories for boys and girls. The region categories range from ‘border’ to ‘west’.

9. Mother's Marital Status – eight categories of mother’s marital status at the time of the birth of the child, ranging from ‘cohabiting’ to ‘widowed’.

10. Mother's Nationality – 13 categories of the mother’s nationality, ranging from ‘Ireland’ to ‘other’.

11. Mother's Residency Status – nine categories of mother’s residency status, ranging from ‘other’ to ‘work permit holder’.

Appendix 3: Policy on access to Growing Up in Ireland (GUI)/National Longitudinal Study of Children in Ireland

(NLSCI) Research Microdata Files (RMFs) relating to

data collected under the Statistics Act, 1993

1. This policy relates solely to GUI/NLSCI RMFs;
2. The legal framework under which access to the RMF(s) is granted is the Statistics Act, 1993;
3. Access to RMF(s) can only be granted by the Director General of the Central Statistics Office (CSO). Appointments made under Section 20(c) of the Statistics Act are signed personally by the Director General of the CSO. An appointment as an Officer of Statistics is personal and non-transferable;
4. Only those persons appointed as Officers of Statistics can access RMF(s);
5. An appointment as an Officer of Statistics is time bound and relates to a specified body of work;
6. The confidentiality of data collected under the Statistics Act, 1993 is guaranteed in law. It should be noted in this regard that the Statistics Act, 1993 does not make a distinction between data on the basis of sensitivity (e.g. historical data periods) and data based on the type of information collected;
7. Access to RMF(s) is granted solely for statistical purposes;
8. Requests for access to RMF(s) must be made using the GUI/NLSCI RMF application form;
9. The application for access will be assessed vis-à-vis the GUI/NLSCI RMF(s) assessment criteria. However notwithstanding the specified criteria the ultimate discretion regarding the provision of access to RMF(s) rests with the Director General of the CSO;
10. Where it is practicable and feasible, data requests will be met via the provision of aggregate data or Anonymised Microdata File (AMF) as distinct from the provision of a RMF;
11. In general only one version of an RMF will be created containing the maximum level of detail that can/will be provided for that particular survey instance.
12. Discussions/analysis relating to individual returns, or information (aggregate tables, descriptive text etc.) which could allow individual returns to be identified must be restricted to persons appointed as Officers of Statistics.

13. Access to RMF(s) for students will be restricted to those undertaking at a minimum post-graduate work and in all such cases their supervisor(s) must also apply and be appointed an Officer of Statistics before access can be granted;

14. In general, requests for the provision of RMF(s) to locations outside of the Republic of Ireland will not be facilitated;

15. Access will only be granted once the CSO is satisfied that the confidentiality and integrity of the data can be maintained. This will include an analysis of the detailed specifications of the 'off-site' IT security procedures and infrastructure;

16. It should be noted that:

    a) External devices supporting portable media (e.g. USB sticks, disc drives) must be disabled on the machines used to access the RMFs; and

    b) The facility to print can remain however we re-emphasise that no hard copy record should be made or kept of individual records.

    c) Internet and email access must be blocked on all PC's being used by researchers accessing or analysing RMF material;

    d) The CSO must be satisfied that the IT network, protocols and security provisions are in place to protect the network to ensure only those person(s) appointed as Officer(s) of Statistics can access the specified area of the network.

    e) Data must be stored on a permanent physically secured device. This device must be encrypted and have all methods of data transfer disabled, i.e., Wi-Fi, Ethernet, Firewire, Thunderbolt and Bluetooth. USB ports must not be usable for mass storage devices. Access must only be via user-specific accounts and logon credentials must not be shared or otherwise communicated.

    f) Back-ups of RMFs are not permitted.

    g) All data processing must be undertaken within the specified secure location identified in the standard agreement.

    h) A meeting with the CSO's Data office staff will be required. The purpose of this meeting is to provide a comprehensive reinforcement of the RMF agreement conditions

17. The CSO reserve the right to inspect the procedures in place, at the 'off-site' location without prior notification, to ensure that the appropriate procedures are in place to protect the confidentiality and integrity of the data;

18. RMF(s) will not contain any identifiable information (e.g. name (person or entity) detailed address, PPSN) to avoid the direct identification of an individual respondent;

19. Persons appointed as Officers of Statistics must not attempt to match/link (at a micro level) the RMF(s) to any other data source;

20. In general, subject to adherence with the Statistics Act, 1993 and the associated policy and protocols for accessing RMFs, access will only be granted to:

    a) Individuals who, either in their own right or as employees of a recognised organisation/institution that has a proven track record in data analysis or research; and

    b) individuals or individuals working in organisations/institutions that can give a clear rationale, acceptable to the Director General of the CSO for access being granted;

21. Responsibility for ensuring the confidentiality of all outputs (reports, publications, presentations, articles etc.) based on the research carried out on the RMF(s) (or using any element of the RMF(s)) rests with the individual(s) appointed as an Officer(s) of Statistics;

22. All completed outputs (reports, publications, presentations, articles, dissertations etc.) from the research project should be provided to the DCYA's NLSCI Project Office.

23. The CSO reserves the right to put outputs from the research into the public domain if the researcher (individual appointed as an Officer of Statistics) has not already done so;

24. The RMF(s), regardless of any amendments made during analysis by the researcher(s) will at all times continue to be the property of the Minister for Children and Youth Affairs;

25. The analysis/research undertaken must comply or be consistent with the specific purpose for which the access was granted;

26. 'Growing Up in Ireland' should be acknowledged as the data source in all outputs (i.e. in reports and analyses). This acknowledgement should also note that;

    a) 'Growing Up in Ireland' has been funded by the Government of Ireland through the Department of Children and Youth Affairs (DCYA) in association with the Central Statistics Office (CSO) and the Department of Social Protection (DSP).

    b) These data have been collected in accordance with the Statistics Act, 1993.

    c) The DCYA, CSO and DSP takes no responsibility for the views expressed or the outputs generated from the research undertaken on the RMF(s). In presenting results/analysis etc from the research project this point should always be highlighted (e.g. in footnotes to aggregate tables, analysis based on derived variables).

    d) The project has been designed and implemented by the joint ESRI-TCD Growing Up in Ireland Study Team. © Department of Children and Youth Affairs.

27. The access must be lawful;

28. The researcher may not copy the RMF(s) (or subsets thereof), or any disclosive analysis/aggregates based on the RMF(s), to any medium or portable device (e.g. print, disk, CD, memory stick);

29. The RMF(s) (or subsets thereof) must not be copied or moved from the agreed location within the organisations IT infrastructure without the prior approval of the CSO;

30. On completion of the research or termination of the conditions relating to the appointment of the individual(s) as an Officer of Statistics all versions of the RMF(s) (or subsets thereof) must be:

    a) Deleted/destroyed by the researcher; or

    b) Returned to the CSO. The RMF(s) will be stored in situations where amendments have been made to the RMF(s) by the researcher appointed as an Officer of Statistics, and who may want to access the amended data file at some point in the future (which will only be possible under the Statistics Act, 1993).

31. Where the RMF(s) is to be deleted/destroyed the person(s) appointed as an Officer of Statistics must certify, in writing, that this task has been completed
(Appendix 2 of the RMF(s) Agreement refers);

32. The RMF(s) will only be provided once the researcher(s) has

    a) Been appointed an Officer of Statistics; and

    b) Signed the Declaration of Secrecy; and

    c) Formally agreed to abide by the RMF(s) Agreement

    d) Had a meeting with staff from the CSO's Data Office, who will provide a comprehensive reinforcement of the RMF agreement conditions.

33. The file will be transmitted via a secure transmission mechanism and will always be encrypted regardless of the transfer mechanism;

34. It should be noted that RMF(s) will not contain any identifiable information to avoid the direct identification of an individual respondent (person or entity). In that context the CSO consider the following transmission mechanisms to be secure:

    a) Transmission of encrypted data via a dedicated site-to-site secure pipe;

    b) Encrypted CD delivered face-to-face (by hand);

    c) Transmission of encrypted CD via registered post;

    d) Transmission of encrypted CD via a recognised courier service;

35. Any breach of the Statistics Act, 1993 is an offence, which may be subject to prosecution;

36. The CSO may undertake an audit (unannounced) of the access granted to ensure compliance with the Statistics Act, 1993 and the policy and protocols attached to the assignment;

37. Failure to comply with the protocols etc. specified in the RMF(s) Agreement may have implications, for the individual and the organisation/institute for whom they work, and for future access to RMF(s). In addition, failure to comply with the protocols etc. will lead to a termination of the appointment as an Officer of Statistics and all data provided must be destroyed/deleted or returned to the CSO;

38. The CSO will maintain a detailed register of individuals appointed as Officers of Statistics for the purpose of accessing RMFs.

39. By signing the RMF Application form and Agreement, the Applicant agrees to the inclusion of their name along with details of their research project(s), including details of any subsequent outputs, in a publicly available GUI/NLSCI RMF Register of Use data base

Appendix 4: Letter of Ethical Approval

25th August 2016

Ref: 160604

Title of Study: A pilot randomised control trial (RCT) to test the feasibility of implementing Triple P® Online among the parents of children experiencing emotional and behavioural problems

Dear Fionnola,

Further to a meeting of the Faculty of Health Sciences Ethics Committee held in August 2016, we are pleased to inform you that the above project has been approved without further audit.

Yours sincerely,

Prof. Brian O'Connell

Chairperson

Faculty Research Ethics Committe

Appendix 5 Screening Interview

Thanks for expressing interest in the study. I just need to ask you some background questions and some questions to check if you are eligible to take part in the study.

1) Do you have access to a computer at home? Yes ☐ No ☐

2) How confident are you in using a computer
   a. Very confident ☐
   b. Confident ☐
   c. Not confident ☐
   d. Never used before ☐

3) How confident are you in using the internet
   a. Very confident ☐
   b. Confident ☐
   c. Not confident ☐
   d. Never used before ☐

4) How often do you use the internet?
   a. Never use ☐
   b. Less than 2 hours per week ☐
   c. 2-5 hours per week ☐
   d. 5-10 hours per week ☐
   e. More than 10 hours per week ☐

5) Are you over 18 years old? Yes ☐ No ☐

6) What age is your child? ___

7) What is your child's gender? Male ☐ Female ☐

8) Has your child been diagnosed with an intellectual disability? Yes ☐ No ☐

9) Has your child been diagnosed with Autism? Yes ☐ No ☐

10) What county do you live in _____

11) Do you live in a:

   a. City ☐
   b. Town ☐
   c. Village ☐
   d. Rural area ☐

Strengths and Difficulties Questionnaire

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain or the item seems daft! Please give your answers on the basis of the child's behaviour over the last six months or this school year.

	Not True	Somewhat True	Certainly True
Restless, overactive, cannot stay still for long	☐	☐	☐
Often complains of headaches, stomach-aches or sickness	☐	☐	☐
Often has temper tantrums or hot tempers	☐	☐	☐
Rather solitary, tends to play alone	☐	☐	☐
Generally obedient, usually does what adults request	☐	☐	☐
Many worries, often seems worried	☐	☐	☐
Constantly fidgeting or squirming	☐	☐	☐
Has at least one good friend	☐	☐	☐
Often fights with other children or bullies them	☐	☐	☐
Often unhappy, down-hearted or tearful	☐	☐	☐
Generally liked by other children	☐	☐	☐
Easily distracted, concentration wanders	☐	☐	☐
Nervous or clingy in new situations, easily loses confidence	☐	☐	☐
Often lies or cheats	☐	☐	☐
Picked on or bullied by other children	☐	☐	☐
Thinks things out before acting	☐	☐	☐
Steals from home, school or elsewhere	☐	☐	☐
Gets on better with adults than with other children	☐	☐	☐
Many fears, easily scared	☐	☐	☐
Sees tasks through to the end, good attention span	☐	☐	☐

Appendix 6: Letter asking permission to place an advertisement on your website

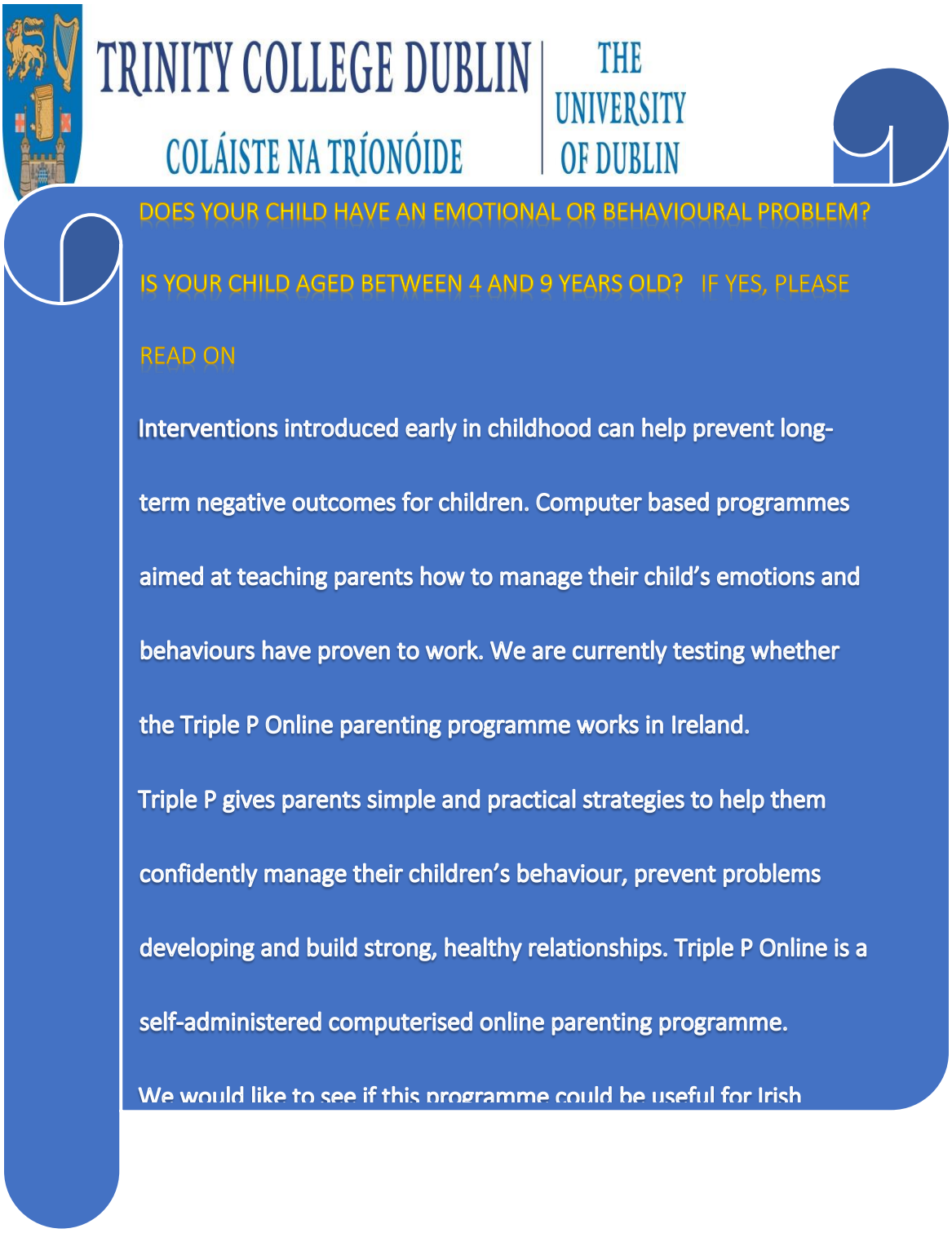
Dear Ms Haugh,

I am writing to request permission to place an advertisement on your website (mummypages.ie). The advertisement will invite the parents of children with emotional or behavioural difficulties to participate in a research study. The aim of this study is to test the feasibility of implementing an Online parenting programme among the parents of children experiencing emotional and/or behavioural difficulties. I have attached the content of the advertisement that I hope to use. I have also attached an information leaflet which gives a detailed outline of my study. If you have any queries please do not hesitate to contact me.

Yours sincerely

Fionnola Kelly

Appendix 7: Advertisement



Appendix 8: Letter from school Principal to Parents

Dear Parent,

Re: New research from Trinity College Dublin

You might be interested to know about an important new study which is being undertaken at Trinity College Dublin. I have been approached by Ms Fionnola Kelly, the lead researcher on the study, and I have agreed to contact you on her behalf as she is actively seeking to recruit parents for her study, all of whom should have children aged 4 to 9 in order to be eligible to participate. Please note that I am contacting all parents, who have children at this school, to inform them of this study.

The aim of this study is to assess the effectiveness of an online parenting intervention in Ireland, for parents of children experiencing emotional or behavioural problems. The online programme normally costs €80, but it is completely free to all those who participate in this study. Also, a €25 one-for-all voucher will be given to all those who complete the research assessments which will be conducted as part of this study.

Participation in the study will involve:

1) Completing a telephone 'screening' interview to inform you of what the study entails and to establish if you are eligible to be included in the study. During this telephone call you will be asked to complete one questionnaire with two sections. The first section focuses on basic information about you and your child, while the second focuses on your child's

emotions and behaviour. The second section will determine whether your child has an emotional or behavioural problem and if you are eligible for the study.

2) Once it has been established that you are eligible to be included in the study, you will be randomly allocated to one of two groups. a. Group 1 - the intervention group (the group which will complete the online parenting programme immediately) or b. Group 2 - the control group (the group which will get the opportunity to complete the programme in 4 months' time).
3) You will then be asked to complete a set of questionnaires (regardless of which group you are in). You will receive via email a link to the questionnaires and you will be asked to complete the questionnaires on your computer which will involve ticking boxes.
4) Once questionnaires are complete, parents randomly assigned to the intervention group will be emailed individual log-in details to the online parenting programme and asked to complete the programme within 3 months.
5) Three months after the study starts the participants in both groups will be asked to complete the same questionnaires that they completed at the beginning of the study. This is to determine whether your child's emotions and behaviour have changed. The parents who completed the online parenting programme will also be asked to complete a client satisfaction questionnaire which will be used to assess how satisfied they were with the programme. Those in the control group will be given the opportunity to complete the online parenting programme four months after the study commences.

For more information about the study and what is involved, please see the information leaflet attached. Many thanks for taking the time to read this, if you are interested in participating in the study please email the lead researcher directly (fkelly7@tcd.ie)

Appendix 9: Participant information leaflet

Study Title: A pilot randomised controlled trial (RCT) to test the feasibility of implementing Triple P Online parenting programme.

Introduction: Parenting programmes which usually run for 12-14 weeks and last for two to three hours each week are the most common parenting programmes in Ireland. A number of computer-based programmes aimed at teaching parents how to manage their child's emotions and behaviours have been shown to work. Triple P Online is an example of an online parenting programme. Triple P Online is a computerised on-line parenting programme developed by Dr Matt Sanders (Matt Sanders is a Professor of Clinical Psychology and is Director of the Parenting and Family Support Centre in the University of Queensland Austrailia). It is an eight-module positive parenting programme delivered via the internet. The traditional Triple P parenting programme is currently being run in the Midlands in Ireland; however the online version of the programme has never been evaluated here.

Aim: The aim of this study is to determine how feasible it would be to run an online parenting intervention (Triple P) in Ireland, for parents of children experiencing emotional or behavioural problems.

To participate in the study you must:

- Have a 4-9-year-old child who you believe currently is experiencing an emotional or behavioural problem. Your child's emotional and behavioural problems will be assessed during a telephone interview when you will be asked to complete some questions about your child. Please note that at no point will your child be asked to take part in this study.
- Have access to a computer and broadband internet connection
- Live in Ireland
- Be aged 18 years or over
- Speak English

Exclusion from participation: *You cannot participate in this study if any of the following are true*:

- You or your child has an intellectual or developmental disability (including autism)
- Your child is taking medication for, or is in regular contact with a professional for, behavioural or emotional problems
- You are under 18 years old
- You are being treated for a mental illness
- You have communication difficulties
- You are seriously ill

Procedure:

(1) If you respond to the advertisement and express interest in the study you will be asked to provide your contact details. You will then be sent via post a consent form. You will be asked to return the signed consent form in a pre-paid envelope.

(2) If you agree to participate in the study you will first be asked to complete a telephone 'screening' interview to inform you of what the study entails and to establish if you are eligible to be included in the study. During this telephone call you will be asked to complete one questionnaire with two sections. The first section focuses on basic information about you and your child, while the second focuses on your child's emotions and behaviour. The second section will determine whether your child has an emotional or behavioural problem. If you have two children with emotional or behavioural problems, you will be asked to answer the questions in relation to one of the children. This telephone interview will take approximately 20 minutes to complete. If you are not eligible for the study, we will let you know immediately.

(3) Once it has been established that you are eligible to be included in the study, you will be randomly allocated to one of two groups. This random allocation is similar to the flip of a coin. The two groups are:
   a. Group 1 - the intervention group (the group which will complete the online parenting programme immediately) or
   b. Group 2 - the control group (the group which will get the opportunity to complete the programme in 4 months' time).

(4) You will then be asked to complete another set of questionnaires (regardless of which group you are in). You will receive via email a link to the questionnaires and you will be asked to complete the questionnaires on your computer which will involve ticking boxes. The questionnaires will cover the following areas:
   a. Your child's emotions and behaviour - you will be asked to complete this questionnaire about your child;
   b. You and your family - you will be asked questions about your marital status, employment status etc.;
   c. Psychological well-being - you will be asked to report on how you are feeling in the last week.
      Parenting style - you will be asked questions about how you manage your child's behaviour.
   d. Child-rearing - you will be asked questions about what issues cause problems for you as a parent.
   e. Relationship - you will be asked questions about the type of relationship you have with your partner.

The questionnaires should take no longer than 60 minutes to complete in total and will be completed by you in your own time.

(5) Once questionnaires are complete, parents randomly assigned to the intervention group will be:
   a) emailed individual log-in details to the parenting programme and asked to complete the programme within 3 months; and
   b) contacted by the researcher 3 weeks and again 6 weeks after the study starts to see if they have had any technical problems and are made aware of the programme features. There will also be a reminder email sent if they have not logged on to the programme for 6 weeks.

(6) Three months after the study starts the participants in both groups will be asked to complete the same questionnaires that they completed at the beginning of the study. This is to determine whether your child's emotions and behaviour have changed. The parents who completed the online parenting programme will also be asked to complete a client satisfaction questionnaire which will be used to assess how satisfied they were with the programme.
(7) Those in the control group will be given the opportunity to complete the online parenting programme four months after the study commences.

Potential benefits: Participants will be given the opportunity to complete a parenting programme, free of charge (usual cost for an individual is €80), which could potentially improve their parenting skills and thus support the emotional and behavioural well-being of their children. Participants who complete the study will receive a €25 one-for-all gift voucher.

Risks and discomforts: There are no anticipated risks to any participants

Provisions for confidentiality: Personal contact details will be shared with the researcher but no one else; confidentiality of participants' personal data will be guaranteed: all information provided will remain strictly confidential; participants' names and other identifiers will not be written on any research data; unique non-personally identifying ID numbers instead of names will be used on research materials. If you so wish, the data that you provide can also be made available to you at your own discretion.

Compensation: This study is covered by standard institutional indemnity insurance.

Voluntary Participation: If you decide to volunteer to participate in this study, you may withdraw

at any time without penalty.

Stopping the study: You understand that the investigators may withdraw your participation in the study at any time without your consent.

Permission: The study has obtained ethical approval from the Faculty of Health Science Research Ethics Committee, Trinity College Dublin.

Further information: You can get more information or answers to your questions about the study, your participation in the study, from Fionnola Kelly who can be contacted at 0877845071. If the study team learns of important new information that might affect your desire to remain in the study, you will be informed at once.

If you would like to take part in this research, please send an email to fkelly7@tcd.ie with your name and address included. A consent form will then be posted to you for you to sign and return in a stamped addressed envelope.

THANK YOU FOR TAKING THE TIME TO READ THIS

Please Note: If you are concerned about your child's mental health you will get more information about the mental health services available to you and your child by contacting the Child and Adolescent Mental Health Services (CAMHS) within the HSE. CAMHS is a service that provides assessment and treatment for young people and their families who are experiencing mental health difficulties. Please click on the link below for further information.

http://www.hse.ie/eng/services/list/4/Mental_Health_Services/CAMHS/

Appendix 10: Family Background Questionnaire

Family Background Questionnaire

This questionnaire collects information about your family. Please read and answer every question in this booklet. All information provided will be treated in strict confidence.

Please mark all selections made on this form with a mark like this: X

1. Your Gender *(Please tick)* a. Male ☐ b. Female ☐

2. Your Age ___ ___

3. Your current marital status: *(Please tick the appropriate box/boxes)*

a. Single ☐ b. Married ☐ c. Divorced/ Separated ☐
d. Living with partner ☐ e. Widowed ☐

4. Your country of birth _____

5. Your highest level of education: *(Please tick the appropriate box)*

a. Primary school or less ☐ b. Some secondary school ☐
c. Completed secondary school ☐ d. Post- secondary school technical training ☐
e. University degree ☐ f. Post-graduate degree ☐

6. Do you have easy access to the Internet?

a. No ☐ b. Yes, dial up ☐ c. Yes, broadband/wireless/mobile phone ☐

7. Do you currently have a medical card?

a. Yes ☐ b. No ☐ c. Don't know ☐

8. Are you working outside the home right now?

a. Yes, full time ☐ b. Yes, part time ☐ c. Not working, but looking for a job ☐
d. Home based work (child care, sewing, internet or phone-based work, etc) ☐
e. Not working by choice (includes retired) ☐ f. Unable to work due to illness/disability ☐
g. Other (please give details) ☐

9a. If you are employed or self-employed, what is your occupation?

_____

9b. If your partner is employed or self-employed, what is his/her occupation?

_____

10. During the past 12 months, has there been a time when your household could not meet its essential expenses? By essential expenses we mean things like food, the mortgage or rent payment, utility bills, child care, or important medical care?

a. Yes ☐ b. No ☐ c. Don't know ☐

11. After you have paid for your essential expenses like food, housing, utilities, childcare and medical care, how much money is left over?

a. Enough that we can comfortably purchase most of the things we really want ☐

b. Enough that we can purchase only some of the things we really want ☐

c. Not enough to purchase much of anything we really want ☐

For these next questions please answer them in relation to your child. If you have more than one child in this age group, please answer the questions in relation to the child whose behaviour concerns you most.

12. Your Child's Gender: Male ☐ Female ☐

13. Your relationship to this child:

a. Mother (biological or adoptive) ☐ b. Father (biological or adoptive) ☐

c. Step-mother ☐ d. Step-father ☐

e. Foster mother ☐ f. Foster father☐

g. Other (please describe)

_

14 At present who lives at home with your child (e.g. parents, siblings, grandparents), including yourself?

Relationship to child	Age
1.	
2.	
3.	
4.	
5.	
6.	

15. Which best describes the household in which your child is presently living?

a. Original family (both biological or adoptive parents present) ☐
b. Step family (two parents, one being a step parent) ☐
c. Sole parent family ☐
d. Other (please describe) _____

16. Have you or your partner attended any other Triple P events?

Triple P Event	You	Your Partner
a. Triple P Seminar	☐	☐
b. Workshop Triple P – Level 3	☐	☐
c. Group Triple P - Level 4	☐	☐
d. Other Triple P event (please describe)	☐	☐

-

_____

_____

_____

17. Are there any other details we have missed that you feel we should know about?
If so, please describe

Appendix 11: Parenting Scale

Parenting Scale

At one time or another, all children misbehave or do things that could be harmful, that are "wrong", or that parents don't like. examples include hitting someone, whining, throwing food, forgetting homework, not picking up toys, lying, having a tantrum, refusing to go to bed, wanting a cookie before dinner, running into the street, arguing back, coming home late.

Parents have many different ways or styles of dealing with these types of problems. Below are items that describe some styles of parenting. For each item, circle the number that best describes your style of parenting during the past 2 months with your child.

Sample Item

At meal time...

I let my child decide how much to eat.	1	2	3	4	5	6	7	I decide how much my child eats.

1. When my child misbehaves...

I do something right away.	1	2	3	4	5	6	7	I do something about it later.

2. Before I do something about a problem...

I give my child several reminders or warnings.	1	2	3	4	5	6	7	I use only one reminder or warning.

3. When I'm upset or under stress...

I am picky and on my child's back.	1	2	3	4	5	6	7	I am no more picky than usual.

4. When I tell my child not to do something...

I say very little.	1	2	3	4	5	6	7	I say a lot.

5. When my child pesters me...

I can ignore the pestering.	1	2	3	4	5	6	7	I can't ignore the pestering.

6. When my child misbehaves...

I usually get into a long argument with my child.	1	2	3	4	5	6	7	I don't get into an argument.

7. I threaten to do things that...

I am sure I can carry out.	1	2	3	4	5	6	7	I know I won't actually do.

Note: From "The Parenting Scale: A Measure of Dysfunctional Parenting in Discipline Situations," by D.S. Arnold, S.G. O'Leary, L.S. Wolff and M.M. Acker, 1993, *Psychological Assessment, 5*, p. 140. Copyright 1993 by the American Psychological Association, Inc. Adapted with permission.

8. I am the kind of parent that...

sets limits on what my child is allowed to do.	1	2	3	4	5	6	7	lets my child do whatever he or she wants.

9. When my child misbehaves...

I give my child a long lecture.	1	2	3	4	5	6	7	I keep my talks short and to the point.

10. When my child misbehaves...

I raise my voice or yell.	1	2	3	4	5	6	7	I speak to my child calmly.

11. If saying no doesn't work right away...

I take some other kind of action.	1	2	3	4	5	6	7	I keep talking and trying to get through to my child.

12. When I want my child to stop doing something...

I firmly tell my child to stop.	1	2	3	4	5	6	7	I coax or beg my child to stop.

13. When my child is out of my sight...

I often don't know what my child is doing.	1	2	3	4	5	6	7	I always have a good idea of what my child is doing.

14. After there's been a problem with my child...

I often hold a grudge.	1	2	3	4	5	6	7	things get back to normal quickly.

15. When we're not at home...

I handle my child the way I do at home.	1	2	3	4	5	6	7	I let my child get away with a lot more.

16. When my child does something I don't like...

I do something about it every time it happens.	1	2	3	4	5	6	7	I often let it go.

17. When there's a problem with my child...

things build up and I do things I don't mean to do.	1	2	3	4	5	6	7	things don't get out of hand.

19. When my child doesn't do what I ask...

I often let it go or end up doing it myself.	1	2	3	4	5	6	7	I take some other action.

20. When I give a fair threat or warning...

I often don't carry it out.	1	2	3	4	5	6	7	I always do what I said.

21. If saying "No" doesn't work...

I take some other kind of action.	1	2	3	4	5	6	7	I offer my child something nice so he/she will behave.

22. When my child misbehaves...

I handle it without getting upset.	1	2	3	4	5	6	7	I get so frustrated or angry that my child can see I'm upset.

23. When my child misbehaves...

I make my child tell me why he/she did it.	1	2	3	4	5	6	7	I say "No" or take some other action.

24. If my child misbehaves and then acts sorry...

I handle the problem like I usually would.	1	2	3	4	5	6	7	I let it go that time.

25. When my child misbehaves...

I rarely use bad language or curse.	1	2	3	4	5	6	7	I almost always use bad language.

26. When I say my child can't do something...

I let my child do it anyway.	1	2	3	4	5	6	7	I stick to what I said.

27. When I have to handle a problem...

I tell my child I am sorry about it.	1	2	3	4	5	6	7	I don't say I'm sorry.

28. When my child does something I don't like, I insult my child, say mean things, or call my child names...

never or rarely.	1	2	3	4	5	6	7	most of the time.

29. If my child talks back or complains when I handle a problem...

I ignore the complaining and stick to what I said.	1	2	3	4	5	6	7	I give my child a talk about notcomplaining.

30. If my child gets upset when I say "No"...

I back down and give in to my child.	1	2	3	4	5	6	7	I stick to what I said.

Appendix 12: Parent Problem Checklist

PARENT PROBLEM CHECKLIST

below are a list of issues over child-rearing which parents often discuss. Please (1) circle either "yes" or "No" to indicate whether or not each issue has been a problem for you and your partner over the last 4 weeks, and (2) circle the number describing the extent to which each issue has been a problem for you and your partner in the last 4 weeks.

	Has this issue been a problem for you and your partner?	To what extent has this issue been a problem for you and your partner?						
		Not at All	A little		Somewhat		Much	very Much
1. Disagreement over household rules (e.g. bedtime, playareas)	yes No	1	2	3	4	5	6	7
2. Disagreement over type of	yes No	1	2	3	4	5	6	7
discipline (e.g. smacking children)	yes No	1	2	3	4	5	6	7
3. Disagreement over who should discipline the children	yes No	1	2	3	4	5	6	7
4. Fighting in front of the children	yes No	1	2	3	4	5	6	7
5. Inconsistency between parents	yes No	1	2	3	4	5	6	7
6. Children preventing parents from being alone	yes No	1	2	3	4	5	6	7
7. Disagreement about sharing childcare workloads	yes No	1	2	3	4	5	6	7
8. inability to resolve disagreements about childcare	yes No	1	2	3	4	5	6	7
9. Discussions about childcare turning into arguments	yes No	1	2	3	4	5	6	7
10. Parents undermining each other, (i.e. not backing each other up)	yes No	1	2	3	4	5	6	7
11. Parents favouring one child over another	yes No	1	2	3	4	5	6	7
12. Lack of discussion between parents about childcare	yes No	1	2	3	4	5	6	7
13. Lack of discussion about anything	yes No	1	2	3	4	5	6	7
14. One parent 'soft' one parent 'tough' with children	yes No	1	2	3	4	5	6	7
15. Children behave worse with one parent than the other	yes No	1	2	3	4	5	6	7
16. Disagreement over what is naughty behaviour								

Note. From *Behavioral Family Intervention* (p. 80), by M.R. Sanders and M.R. Dadds, 1993, Needham Heights, MA: Allyn and Bacon. Copyright 1993 by Allyn and Bacon. Adapted with permission.

Appendix 13: Depression Anxiety Stress Scales-21 (DASS-21)

DASS21

Name: *Date:*

Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

Appendix 14: Relationship Quality Index

RELATIONSHIP QUALITY INDEX

instructions: Circle the number that best describes the degree of satisfaction you feel in various areas of your relationship with your partner.

	very strongly disagree	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	very strongly agree
1. We have a good relationship	1	2	3	4	5	6	7
2. My relationship with my partner is very stable	1	2	3	4	5	6	7
3. My relationship with my partner is strong	1	2	3	4	5	6	7
4. My relationship with my partner makes me happy	1	2	3	4	5	6	7
5. i really feel like part of a team with my partner	1	2	3	4	5	6	7

6. All things considered, what degree of happiness best describes your relationship?

1	2	3	4	5	6	7	8	9	10
unhappy					happy				Perfectly happy

Note. From "Measuring marital quality: A look at the dependent variable," by R. Norton, 1983, *Journal of Marriage and the Family, 45*, p. 147. Copyright 1983 by the National Council on Family Relations, US. Adapted with permission.

Appendix 15: Client Satisfaction Questionnaire

Client satisfaction survey

This questionnaire will help us to evaluate and continually improve the program we offer. We are interested in your honest opinions about the programme you completed, whether they are positive or negative. Please answer all the questions.

1. How would you rate the quality of the programme?

☐ ☐ ☐ ☐ ☐ ☐ ☐

Poor **Excellent**

2. Did you receive the type of help you wanted from the programme?

☐ ☐ ☐ ☐ ☐ ☐ ☐

No, definitely not **Yes, definitely**

3. To what extent has the programme met your child's needs?

☐ ☐ ☐ ☐ ☐ ☐ ☐

No needs have been met **Almost all needs have been met**

4. To what extent has the programme met your needs?

☐ ☐ ☐ ☐ ☐ ☐ ☐

No needs have been met **Almost all needs have been met**

5. How satisfied were you with the amount of help you received?

☐ ☐ ☐ ☐ ☐ ☐ ☐

Quite dissatisfied **Very satisfied**

6. Has the programme helped you to deal more effectively with your child's behaviour?

☐ ☐ ☐ ☐ ☐ ☐ ☐

No, it made things worse **Yes, it has helped a great deal**

7. Has the programme, helped you to deal more effectively with problems that arise in your family?

☐ ☐ ☐ ☐ ☐ ☐ ☐

No, it made things worse **Yes, it has helped a great deal**

8. Do you think your relationship with your partner has been improved by the programme?

☐ ☐ ☐ ☐ ☐ ☐ ☐

No, definitely not **Yes, definitely**

4. In an overall sense, how satisfied are you with the programme?

Quite dissatisfied **Very satisfied**

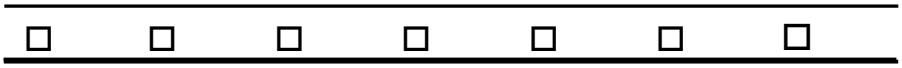
5. If you were to seek help again, would you come back to Triple P Online?

No, definitely not **Yes, definitely**

6. Has the programme helped you to develop skills that can be applied to other family members?

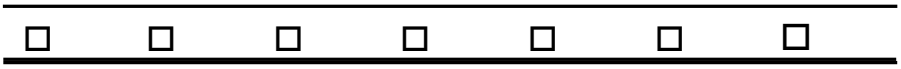
No, definitely not **Yes, definitely**

7. In your opinion, how is your child's behaviour at this point?



Considerably worse **Greatly improved**

8. How would you describe your feelings at this point about your child's progress?



Quite dissatisfied **Very satisfied**

9. Do you have any comments about this programme?

10. If you did **not** complete the entire programme can you please give reasons for non-completion?

Appendix 16: Informed Consent Form

PROJECT TITLE: A pilot randomised controlled trial (RCT) to test the feasibility of implementing Triple P Online parenting programme.

PRINCIPAL INVESTIGATOR: Fionnola Kelly

BACKGROUND

Parenting programmes which usually run for 12-14 weeks and last for two to three hours are the most common parenting programmes run in Ireland. A computer-based approach has been proposed as an alternative for delivering evidence-based parenting programmes. A number of computer-based programmes aimed at teaching parents how to manage their child's emotions and behaviours have been shown to work. Triple P Online is an example of an online parenting programme. The aim of this study is to determine the feasibility and acceptability of an online parenting intervention (Triple P) for parents whose children may be displaying emotional or behavioural issues.

PROCEDURE

(1) I agree to participate in this study and will complete the questionnaires outlined in the information leaflet.
(2) If I am assigned to the intervention group I agree to complete the Online parenting programme within three months of receiving the programme.
(3) If I am assigned to the control group I understand that I will NOT receive the Online parenting programme until after the study is completed.

DECLARATION

I have read, or had read to me, the information leaflet for this project and I understand the contents. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction. I freely and voluntarily agree to be part of this research study. I understand that I may withdraw from the study at any time without penalty and I have received a copy of this agreement.

PARTICIPANT'S NAME: ……..

CONTACT DETAILS: ……..

PARTICIPANT'S SIGNATURE: ……..

Date:……..

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent. Identifiable information will NOT be retained after the study is completed. NO information will be used in future unrelated studies without further specific permission being obtained

INVESTIGATOR'S SIGNATURE:…… Date:……..

Appendix 17: Publication submitted for peer review

A Cohort study of early indicators of Emotional and Behavioural Difficulties in young children

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Abstract

Background: Emotional and behavioural difficulties (EBD) are the most common reason for referral of children to mental health services. *Aim:* The aim of the study was to establish whether risk factors identifiable in infancy and early childhood predict EBD in five-year-old children. *Method:* Data from the longitudinal Growing Up in Ireland (GUI) infant cohort study were examined. The data were based on interviews conducted with parents (n=8,707) of children at three time points: when the child was nine months old, three years old and five years old. The Strengths and Difficulties Questionnaire (SDQ) was used to determine EBD. The relationship between potential risk factors and the SDQ binary outcome variable of any EBD when compared to none, was examined using logistic regression. *Results:* 11.5% of five-year-old children in Ireland had an EBD according to parental report. The three most significant predictors of EBD in five-year-old children were: having EBD at the age of three; the mother reporting high levels of hostility in parenting style and the mother reporting high levels of stress. *Conclusion:* This study provides important insights into the risk factors associated with EBD in early childhood and suggests a need for intervention and prevention in the earliest years.

Keywords: Children, emotional, behavioural, risk factors, parenting, early intervention

Introduction

In childhood, mental health problems primarily involve emotional and behavioural difficulties (EBD) (5) including, for example, hyperactivity and aggression (also known as 'externalising' behaviours), as well as internalising behaviours such as anxiety, withdrawal and depression (5). EBD is the most common reason for referral of children and adolescents to mental health services and have a range of negative longer-term outcomes into adolescence and adulthood, including low levels of educational attainment, drop-out, conduct problems, entry into the criminal justice system, substance abuse and mental health difficulties (6). In Scotland, 11% of five-year-olds were reported as having borderline or abnormal EBD (7) compared to 13% and 15% of seven-year-old children in Northern Ireland and England respectively (8).

There are a number of risk factors associated with EBD in children, many of which begin in infancy and early childhood (9). Studies have shown that preterm children exhibit a higher prevalence of behavioural problems than the overall population (10), while there is evidence to suggest that having a difficult temperament as a baby can predict EBD in childhood (11). Physical ill-health in childhood has also been shown to be associated with an increased risk of EBD (12). For instance, in an Australian longitudinal study which examined the predictors of EBD, Bayer et al. (12) found that children who had a physical illness were more likely to suffer from emotional problems than children who had no health issues. Similarly, they found that children with speech and language difficulties were also more likely to have emotional problems.

There is considerable evidence to show that there are a number of parental risk factors associated with EBD in early childhood. One of the most significant developments during the first year of the child's life is the development of an attachment relationship to the primary caregiver, usually the mother (13). A number of studies have found an association between insecure infant attachment and EBD in childhood (14, 15). Severe or chronic illness in parents has also been associated with problem behaviour in children (16-19). Harland et al. (17) found that children who lived with a parent who had an illness were at a greater risk of developing EBD than children who lived in a household where no illness was present. In addition, parental stress has been linked to EBD in early childhood (20-22). Similarly, several studies have found that maternal depression can have a negative impact on children's behavioural outcomes (23-26). The EDEN mother-child birth cohort study (26) found that children whose mother had persistent symptoms of depression were more likely to have high levels of EBD than children whose mothers were never depressed.

Children who experience alcohol abuse can also be particularly vulnerable to EBD (27). A Norwegian population health study found that maternal alcohol abuse was found to significantly predict mental distress in children (28). Likewise, Edwards et al. (27) in their US longitudinal study, found that children with alcoholic fathers had higher levels of EBD than children of non-alcoholic fathers. Another critical risk factor is the effect of parental conflict on children's EBD. Evans et al. (29) conducted a meta-analysis to examine the relationship between childhood exposure to domestic violence and children's outcomes and found a moderate association between exposure to domestic violence and EBD in children.

In an Irish context, Growing Up in Ireland (GUI) is a national longitudinal infant cohort study of children born in Ireland between 1st December 2007 and 30th June 2008 (30). This study is designed to describe and examine what it means to be a child in Ireland and to understand the issues associated with children's well-being, including those that impact their physical health and development, their social, emotional and behavioural well-being, and their educational achievements (30). The aims of the study reported here were to use the GUI data to identify the prevalence of EBD in Irish children and establish whether risk factors identifiable in infancy (nine months) and early childhood (three years) can predict emotional and behavioural outcomes in five-year-old children.

Method

Study design

The GUI study population was derived from the Irish Child Benefit Register. In Ireland, child benefit is paid each month in respect of all children under the age of 16 years (Thornton et al., 2013). As it is a payments database, the Child Benefit Register must be current and fully up-to-date (30). Further details of the sampling and consent process for the GUI study are described elsewhere (31).

GUI data were collected using questionnaires and interviews conducted with parents (n=11,134) at three different time points: (1) in 2008-2009 when the children were aged nine months; (2) in 2011-2012 when the children were aged three years; and (3) in 2013-2014 when the children were aged five years. Interviews were conducted with the primary care-giver (PCG) and the

resident secondary care-giver (SCG). The PCG was generally the biological mother of the Study Child (99.7% of cases) and the SCG was most likely to be the biological father (99.6%). For the remainder of this report, we refer to primary and secondary caregivers as mother and father respectively. The three waves of data were linked together to produce a single dataset, providing a longitudinal cohort of children followed over three time points. Participants were excluded if they did not take part in all three waves, or if they did not have a valid score on the primary outcome measure (see below). This resulted in a total sample of 8,707 cases (78% of the original cohort) (see flow chart - Appendix 1 - for numbers included in the study and those lost to follow-up).

Primary Outcome Variable

The primary outcome variable in the final wave at age five years was emotional and behavioural difficulty (EBD), measured using the Strengths and Difficulties Questionnaire (SDQ) (32). The SDQ is a 25-item behavioural screening questionnaire which incorporates five different dimensions of children's behaviour including: conduct problems, inattention hyperactivity, emotional symptoms, peer problems, and pro-social behaviour (32). Each attribute is rated (by the parent) using a scale from 0 to 2 (not true, somewhat true, and certainly true). Responses are summed to provide a total score for each dimension. The first four scales may be combined to yield a 'total difficulties' score. This screening measure is widely used in cohort studies (12) and is a psychometrically robust tool for use by parents of children aged 3-16 (33). This score was used

to identify the existence (or not) of EBD depending on whether or not the score exceeded 13. The reference category[1] chosen was the absence of EBD.

Covariates

The covariates considered in this study were based on a review of the literature relating to EBD in early childhood. These were divided into four categories of risk relating to the child, the mother, the father and the family as a whole.

Childhood risk factors were assessed using the following variables: gender (with female chosen as the reference category); gestational age (10), categorised into two groups (born before 37 or after 37 weeks); baby temperament, also categorised into two groups (having or not having a fussy/difficult temperament (11) as a baby (see Appendix 2 for more information); and having/not having a long term illness or disability (12) at the age of three or five years which was also categorised into two groups. For all the above variables, the second of the two groups was chosen as the reference category. Finally, the presence of EBD (9) at the age of 3 years and the existence of speech problems (12) at the age of three or five years, were also considered as childhood risk factors, with the absence of EBD and speech problems being the reference categories respectively.

Maternal and Paternal risk factors were assessed using mental health status (23-25), parental attachment (14, 15), parental stress (34-36), and parenting style (14, 15). The first of these was assessed using the 8-item Centre for Epidemiological Studies in Depression scale (CES-D) (37). Scores above 7 indicate the presence of depressive symptoms (37), scores of 7 and below are

[1] Category (no EBD) against which other category/categories (having EBD) is compared.

classified as not depressed; the latter was used here as the reference category. There are no established cut-off points to indicate healthy and unhealthy attachment so we used the bottom 10th percentile to indicate unhealthy attachment, with all other scores considered as healthy attachment (reference category). Parental stress was assessed using the 'Parental Stressors' subscale of the Parental Stress Scale (29). Higher scores for parental stress indicate more stress (30), such that those who scored in the top 10th percentile were categorised as displaying high levels of stress with all other scores categorised as normal (reference category).

Parenting style was assessed using subscales from the Longitudinal Study of Australian Children (LASC) to assess three key aspects of parenting – warmth (displays of affection, awareness of child's needs), hostility (controlling or over-controlling parenting—negativity, use of physical discipline, rigid enforcement of rules and expectations) and consistency (the setting and consistent application of age-appropriate rules and expectations) (38). There are no established cut-off points to indicate normal/abnormal levels of warmth, hostility or consistency, so the top/bottom 10th percentile was used to indicate extreme styles of parenting, with all other scores considered 'normal' (reference category). Thus, parents who scored in the bottom 10th percentile for warmth and consistency were categorised as displaying low warmth/low consistency and those who scored above this were categorised as displaying normal levels of warmth/consistency. Similarly, parents who scored in the top 10th percentile for parental hostility were categorised as displaying high hostility.

Additional parent risk factors were assessed using the following variables: mother's age at birth (12) (categorised as <25 years or 25 years and older (reference category)); whether the parents smoked (39) so that those who smoked in wave 1 or wave 2 were compared to those who did not smoke in either wave (reference group); whether the mother smoked during pregnancy (40, 41), with no smoking in pregnancy as the reference category. Other variables that were considered include: whether the parents misused alcohol (27, 28) in wave 1 or wave 2 (see Appendix 2 for more information); whether the mother consumed alcohol during pregnancy (42) or used licit or illicit drugs (43) in wave 1 or wave 2, with not consuming/misusing as the reference category in all cases.

Further parental risk factors included: whether the parents had an illness or disability (12, 17) (any chronic illness/disability in wave 1 or wave 2 compared to not having an illness/disability in either wave (reference category)); level of education, such that the highest level of education (12, 44) attained was categorised into those who completed lower secondary or less versus those who completed above this (reference category); whether or not the parents were employed (45, 46) (i.e., not employed in wave 1 or wave 2 versus those employed in either wave 1 or wave 2 and those employed in both waves (reference group)).

Family risk factors Family structure (12, 47) was categorised into single parent or two-parent families (reference category). Annual household income (48, 49) was also categorised into two groups - those who had low versus those who had middle to high levels of income (reference category) (see Appendix 2 for further detail). Conflict (50) within the family was assessed using

the response to two questions inquiring about the frequency of throwing something or pushing/hitting/slapping/fighting during an argument/fight (i.e. 1=Never, 2=Not often, 3=Sometimes, 4=Often, 5=Almost always). Scores between 2 and 5 were categorised as living in a family where some degree of conflict was present (when compared to a score of 1 indicating the absence of any physical conflict (reference category).

Statistical Analysis

Prior to analysis, the data were re-weighted by the GUI research team according to a proportional weight to account for survey response (see Appendix 3 for more detailed information). The variables used in the re-weighting included: family structure; mother's age; principal economic status of each parent; family's social class; mother's education; household tenure; geographical region; child's gender; mother's marital status; mother's nationality; and mother's residency status.(30) Dummy codes for missing or not applicable data were created to ensure that all 8,707 individuals were included in the multivariate logistic regression model. The relationship between potential risk factors and the SDQ binary outcome variable of any EBD compared to none, was examined using binary logistic regression. Unadjusted analyses were performed for each factor followed by an adjusted (multivariate) logistic regression model including all risk factors found to be significant at $p<0.10$ in the unadjusted analyses. Odds Ratios (ORs), 95% Confidence Intervals and statistical significance were reported for both the unadjusted and adjusted models. Analyses were conducted using SPSS Version 23 and significance at $p<0.05$ is assumed.

Results

Characteristics of the baseline group, the follow-up participants, and those lost to follow-up are shown in Table 1. The children lost to follow up were significantly ($p<0.05$) more likely to live in a single parent household, have mothers who were younger and who left school early. However, these potential sources of bias were addressed during the re-weighting phase of the analysis to minimise impact on the overall results.

Please insert Table 1

Almost 12% (n=997) of the sample of five-year-old children were identified as having EBD, over 60% (n=610) of whom were male. Table 2 presents the unadjusted and adjusted logistic regression models of factors predicting EBD in five-year-old children. Significant childhood predictors in the adjusted model included (from most to least significant in terms of their odds ratios): having EBD at the age of three; having a chronic illness or disability at the age of three or five years; having a speech problem at the age of three or five years; being born prematurely; being male; and having a difficult or fussy temperament as a baby. Significant maternal predictors included (from most to least significant in terms of their odds ratios): reporting high levels of hostility; high levels of stress; low levels of consistency in parenting style; being a young mother; having a chronic illness or disability; lacking in sensitivity (low attachment score); and having a low level of education. The most significant paternal predictor of EBD was being intermittently unemployed when the child was in infancy or early childhood, this was followed by reporting high levels of stress and lastly misusing alcohol during the same period. Finally, only one family predictor – presence of parental conflict - remained significant in the adjusted model.

Please insert Table 2

Discussion

The results of this study indicate that almost one in eight (12%) five-year-old children in Ireland have EBD. This figure is similar to the prevalence rates reported in other longitudinal studies conducted in Northern Ireland and Scotland and using the same outcome measure (SDQ). The results suggest that a range of child and family risk factors in early childhood increases the risk of EBD in five-year-old children in Ireland. Overall, the three most statistically significant predictors of EBD in five-year-old children were the presence of EBD at the age of three, high levels of self-reported hostility in parenting style amongst mothers and high levels of self-reported stress in the child's mother.

These findings are consistent with those reported by Edwards and Hans (24) in their work conducted in the US, which found that risks for behaviour problems in young children may be present as early as infancy when children are first engaging with their parents and family environment. The presence of a speech and language problem, or an illness or disability, between the ages of three and five were significantly associated with EBD at five years. This is an interesting and important finding and one which has been rarely seen elsewhere; for example, in one study in Australia Bayer et al. found that children with speech and language difficulties were more likely to have emotional problems than children without such difficulties (12). The greater risk of EBD in children with speech problems requires further examination to establish the developmental trajectories of this cohort. Gilberg (51) argues that children with EBD are likely to have co-existing problems across different areas of their development and points to a growing

realisation that the co-existence of difficulties and sharing of symptoms across difficulties is the rule rather than the exception. Arguably, children (aged three-to-five years) with major difficulties in any area of their health or development should be referred to a multi-disciplinary team rather than a specialist (51). Unsurprisingly and as widely reported in the literature, our findings also suggest that boys are more likely than girls to have EBD at five years (22, 52).

A significant association between negative maternal parenting (unhealthy attachment, hostile and inconsistent parenting) and EBD in early childhood was also found in our study. These findings are consistent with a small number of studies undertaken in the US; for example, Erickson et al.'s (53) Minnesota study showed that insecure attachment at 12 and 18 months increased the risk of EBD for pre-schoolers (n=267), while Miner et al. (54), who followed up 1,171 American children and their parents, over 5 points in time (when they were aged between 2 and 9 years old), found that mothers' harsh discipline was associated with children's more frequent externalising behaviour.

The association between maternal illness and EBD was another significant finding in the current study. This finding is in line with other studies which have examined the effects of parental illness on the mental health and well-being of children (16-19). For example, Harland et al. (17) found that children who lived with a parent who had an illness were at greater risk of developing EBD than those children who lived in a household where no such illness was present. Furthermore, Sieh at al. (55) who conducted a meta-analysis comparing problem behaviour in children of a chronically ill parent with children whose parents were not ill found that children of

chronically ill parents were at a higher risk of both internalising and externalising problems, they also found that this was most significant in younger children. Longitudinal studies on the impact of parental illness on the mental health and well-being of young children are limited. Thus, the current study represents an important addition to the literature and particularly in a European context. However, further longitudinal studies are needed to follow the progress of this cohort to establish how their mental health is being impacted by their parent's illness as they get older.

We also found a significant association between parental stress (both maternal and paternal) and EBD in early childhood. A number of other studies have reported similar findings (20, 22, 56). For example, Anthony et al. (19), whose US study examined whether parenting stress in the home is related to children's behaviour while in preschool, found that parental stress was significantly related to EBDs, and the effects of parenting behaviour did not appear to mediate this relationship. Ashford et al (56) reported similar findings. They investigated the early risk indicators of internalizing problems in late childhood. They followed a cohort of Dutch children (n=294) longitudinally from the ages of two to 11 years. The authors found that parental stress between the ages of four and five years was a strong predictor of internalizing problems at the age of 11. The current study is one of the few, which have examined longitudinally the influence of both parents on early childhood development, using a large representative national sample. However, a need for more research in this area is indicated.

The findings from the current study indicate that being exposed to violence within the family significantly increases the risk of EBD. A large number of studies have found that exposure to

domestic violence has strong adverse outcomes for children, resulting in increased levels of aggression, depression, anger, and anxiety (29, 50, 57, 58). For example, Evans et al. (29) used meta-analysis to examine the relationship between childhood exposure to domestic violence and children's outcomes. They examined 60 studies and found that there was a moderate association between exposure to domestic violence and EBD in children. Likewise Huang et al. (50) found that children (n=5,000) who were exposed to domestic violence when they were aged one had a greater risk of developing EBD at age five than children who were not exposed to such violence. However, other studies suggest that it's not the child's exposure to violence which increases their risk of EBD, but the negative impact of domestic violence on parental mental health which actually increases the risk (47, 48).The current study provides convincing evidence to indicate that growing up in a family where conflict is present has a detrimental impact on the mental health of young children.

In the current study, we also found a significant relationship between risky alcohol use in fathers and EBD in early childhood. This result is consistent with findings from other research in this area (27, 59-61). For example Edwards et al. (27) who examined the relationship between paternal alcoholism and toddler behaviour in a sample of 176 children found that children with alcoholic fathers had higher levels of EBD than children of non-alcoholic fathers. However, interestingly, they also reported that children with secure relationships with their mothers had significantly lower externalizing problems than insecure children of alcoholic fathers. Therefore, positive maternal parenting appears to mediate for some negative childhood experiences. The ability to follow a large cohort of children longitudinally from infancy to early childhood is a key strength

of the current study and adds to our understanding of the increased risk of EBD among the children of alcoholic fathers.

This study has a number of strengths. It is based on a large representative sample of parents who were interviewed over three time points in the early childhood years. It examined a wide range of potential child, maternal, paternal and family risk factors, using a number of psychometrically robust measures. Fathers are often excluded from parenting studies, but both mothers and fathers (77% of fathers) were interviewed in this study and characteristics of both were examined. Another major strength of this study lies in its size and detailed measurement of factors linked to children's emotions and behaviours. This is one of the few studies to conduct a longitudinal analysis of maternal, paternal and child risk factors associated with EBD in early childhood.

However, the study also has some limitations. Attrition is a common problem in longitudinal studies, and even though response weights were used to account for attrition, the children lost to follow-up were significantly more likely to live in a single parent household, were more likely to have mothers who were younger and mothers who left school early. Therefore, our results may be subject to bias despite the use of the survey response weights. Although the SDQ, which was used to assess EBD, is a reliable and validated measure, it is not a diagnostic tool and, therefore, it must be noted that no diagnostic/clinical assessment was undertaken on the children in this study. In addition, the SDQ reported in this study was completed by parents only; therefore, there may have been some bias as to how they viewed their child's behaviour. Further

research could, for example, undertake observational work with both parents and their children (62) and/or compare teacher and parent reported SDQ scores for five-year-old children in order to establish a more holistic and potentially less biased perspective on child behaviour.

Implications for policy and practice

As is evident from this study, EBD can emerge in early childhood and risk factors can be identified as early as infancy and early childhood. Our findings provide convincing evidence to suggest that any interventions designed to treat these problems (e.g., parenting programmes and other parenting supports) should be implemented as early as possible in children's lives. Indeed, the ENRICH (**E**valuatio**N** of w**R**aparound in **I**reland for **CH**ildren and families) research programme in Ireland (see, e.g., (63) is testing the effectiveness and cost-effectiveness of the Incredible Years Parent and Baby programme which is being delivered (as part of a larger wraparound-inspired service model) by Public Health Nurses to parents of young infants (e.g., 8-10 weeks) in an attempt to help them develop healthy attachments and behaviours from the outset (see www.cmhcr.eu for further information). Little is known about the effectiveness of such early interventions, but the findings reported here suggest that there may be merit in targeting potentially vulnerable sub-groups early (e.g., through the delivery of evidence-based parenting programmes) where there is evidence of, for example, parental conflict, parental alcoholism, parental stress and parental ill-health. The findings further suggest that it is important that parents who have children with a long-term illness or disability are given information and advice on how to manage their children's emotions and behaviour, as this aspect of well-being may be inadvertently neglected due to more pressing physical health issues.

It is also important that mothers who have a long-term illness themselves are given extra supports with regard to helping them to better manage their child's emotional and behavioural well-being. Finally, the greater risk of EBD in children with speech problems is particularly important and relevant for Speech and Language Therapists, Public Health Nurses and others who may not immediately link these kinds of difficulties to aspects of behaviour and emotional well-being.

Conclusion

The risk factors identified in our study are consistent with the small, but growing pool of research advocating for greater mental health and well-being supports in early childhood. Our findings raise some important issues including, firstly, the need for services to focus more on the mental health and well-being of young children (particularly EBD) in the earliest years as this may not be a transient issue. Secondly, the findings suggest that there is a need for health and social care professionals to be more aware of how parenting practices and parental stress can affect the mental health and well-being of young children. Finally, the results indicate that there is a need for more research on early intervention to help reduce or prevent EBD in early childhood in order to prevent the numerous negative outcomes that can materialise if these problems are left untreated.

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Declaration of interest

The authors have declared that they have no competing or potential conflicts of interest.

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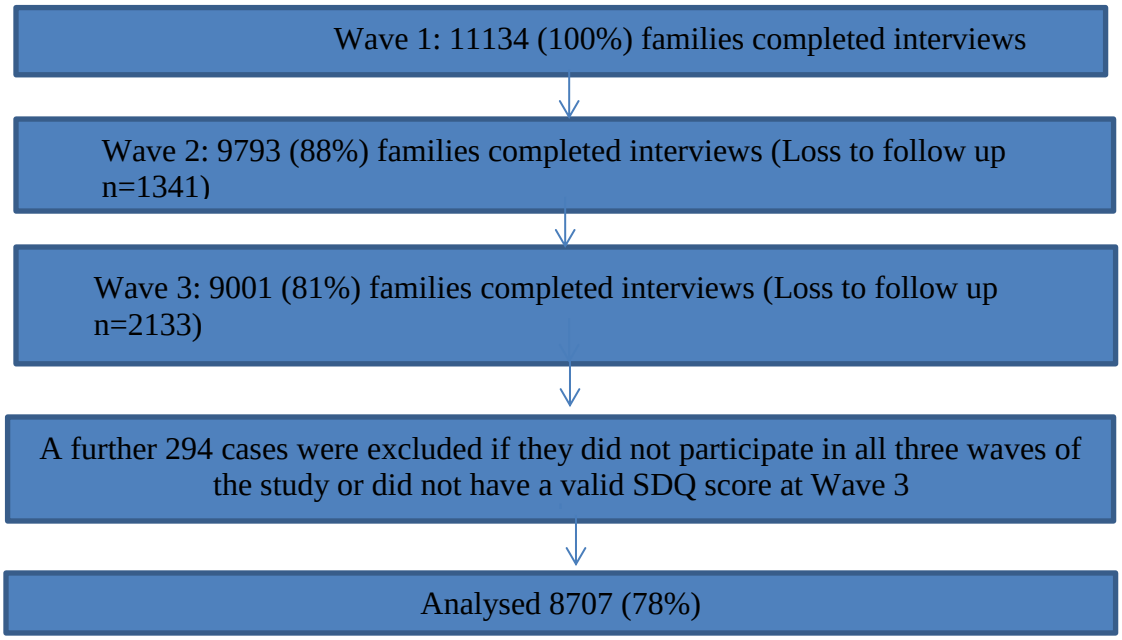
Appendix 1:

Figure 1: Numbers included in the study and those lost to follow up



Appendix 2: Additional variable information

Baby temperament

Baby temperament was assessed using the Infant Characteristic Questionnaire (ICQ) which yields four sub-scale scores: 'Fussy-difficult', 'Unadaptable', 'Dull' and 'Unpredictable' (34). The first of these was used in this study as it is the most widely validated score, which has been shown to be associated with subsequent problem behaviour in children (35). Higher scores on this scale indicate a more difficult/fussy baby. Thus, babies who score in the top 10th percentile are categorised as being difficult/fussy whilst those who score below this are categorised as not being difficult/fussy.

Hazardous drinking/Misuse of Alcohol

The FAST alcohol-screening test (38) was developed in the UK as a short screening tool for alcohol misuse. According to the authors, people may be classified as 'hazardous' or 'not hazardous' drinkers using the answer to the question "How often do you have EIGHT or more drinks on one occasion?" (Six drinks for women). Anyone who answered that they did this on one occasion *weekly* or *more often* were classified as hazardous drinkers.

Family income

To make meaningful comparisons across families in terms of their disposable income, household size and composition (number of adults and children) were taken into account to create an 'equivalised' family income. To do this, the number of 'equivalised' adult members who were resident in the household was calculated, by assigning a weight of 1.0 to the first adult, 0.66 to all subsequent adults (and children over 14 years) and 0.33 to each child (aged 14 years or less). The total number of adult equivalents was then divided into the household's total disposable income to give the household's equivalised disposable income. The families were then divided into five equally sized groups, from highest to lowest in terms of their equivalised family income. Each group (or quintile) contains 20 per cent of five-year-olds and their families. The lowest family income quintile refers to the 20 per cent of families at the bottom of the equivalised income distribution. The second lowest income group includes the families in the next 20 per cent of the income distribution and so on, up to the top income quintile, which contains the 20 per cent of families with the highest equivalised income. For the purpose of this study, the five categories were re-classified into two categories. The two lowest income quintiles were classified as low-income families, while the other three categories were classified as mid to high-income families.

Parenting Style

There are no established cut-off points to indicate normal/abnormal levels of warmth, hostility or consistency, so the top/bottom 10th percentile was used to indicate extreme styles of parenting, with all other scores considered 'normal' (reference category). Thus, parents who scored in the bottom 10th percentile for warmth and consistency were categorised as displaying low warmth/low consistency and those who scored above this were categorised as displaying normal levels of warmth/consistency. Similarly, parents who scored in the top 10th percentile for parental hostility were categorised as displaying high hostility

Appendix 3: Re-weighting of GUI Data (Technical Report 2 GUI)

The sample weights for the first phase of the nine-month cohort of *Growing Up in Ireland* were constructed by adjusting the distribution of the sample to known population figures. The population distributions were derived from two sources. The first was special tabulations prepared by the Central Statistics Office detailing the number and characteristics of infants (aged less than one year old) and their families. These were extracted from the 2006 Census of Population, the most up-to-date and comprehensive source of information on the distribution of children in Ireland. Given the way the information is recorded in the Census of Population, the breakdown of infants according to their characteristics is based on those aged less than one year. It is not possible to extract figures in respect of those aged nine months of age on the night of the census. There are likely to be, at most, minimal differences in the structural composition of infants aged less than one year as compared with those aged nine-months.

The second source was the Child Benefit Register from which the sample was drawn. The 73,662 children born in calendar year 2008 were taken as the population to which the sample was statistically weighted and grossed. This provided the total figure to which the grossed sample was calibrated. The system used for generating the sample weights was based on a minimum information loss algorithm, which ensured that the distribution of cases in the completed sample matched a set of control totals for the population. It is based on an iterative approach to the fitting of column marginals from the completed sample to those of the population as a whole. The child was the unit used in the weighting system. The characteristics of their family were assigned to each child in the sample. Eleven main characteristics were used in the generation of the weights and grossing factors, as outlined and defined below. Variables 1 to 8 were derived from the 2006 Census of Population, and variables 9 to 11 from the Child Benefit Register.

1. Family Structure – 12 categories based on lone or two-parent family combined with the number of persons (not children) in the family unit. This gives a classification based on cohabiting couple, married couple and one-parent families, along with the number of persons in their family.
2. Mother's Age – five categories of mother's age, ranging from '25 years or less' to '41 years or more'.
3. Mother's Principal Economic Status (PES) – five categories of mother's work situation, ranging from 'working for payment or profit' to 'looking after the home'.
4. Father's Principal Economic Status (PES) – six categories of father's work situation, ranging from 'working for payment or profit' to 'father not resident'.
5. Family's Social Class – seven categories of family's social class ranging from 'professional workers' to 'family validly has no class code'. Mother and father's social class were derived from current or most recent occupation (if currently unemployed or retired). A category was included for those who validly do not have a social class classification because they have never worked outside the home. When the Social Class of father and mother have been assigned, family social class is then based on the higher of the two. This is a standard way to assign collective family social class and is referred to as the 'dominance' criterion.

6. Mother's Education – 13 categories of mother's highest level of educational attainment ranging from 'no formal education' to 'doctorate'.
7. Household Tenure – five categories of the household's tenure of their accommodation, ranging from 'owner occupier, with or without a loan' to 'occupied free of rent'.
8. Region / Child's Gender – 16 categories summarising the geographical location of the child, with separate categories for boys and girls. The region categories range from 'border' to 'west'.
9. Mother's Marital Status – eight categories of mother's marital status at the time of the birth of the child, ranging from 'cohabiting' to 'widowed'.
10. Mother's Nationality – 13 categories of the mother's nationality, ranging from 'Ireland' to 'other'.
11. Mother's Residency Status – nine categories of mother's residency status, ranging from 'other' to 'work permit holder'.

Table 1: Characteristics of baseline, follow-up and lost to follow-up populations.

	Baseline (total n=11,134)	Follow-up (n=8,707)	Lost to follow up (n=2,427)
	N (%)	N (%)	N (%)
Gender of study child			
Male	5679 (51)	4410 (51)	1269 (52)
Female	5455 (49)	4297 (49)	1158 (48)
Maternal age			
16-24 years	1273 (11)	818 (9)	455 (19)
25-34 years	6188 (55)	4832 (56)	1356 (56)
35-44 years	3673 (33)	3057 (35)	616 (25)
Education level (Mother)			
Lower secondary or less	1306 (12)	894 (10)	412 (17)
Upper secondary to lower third	5787 (52)	4526 (52)	1261 (52)
Upper third	4031 (36)	3283 (38)	748 (31)
Missing data	10 (0.1)	4 (0.1)	6 (0.3)
Family structure			
Single parent household	1359 (12)	889 (10)	470 (19)
Two parent household	9775 (88)	7818 (90)	1957 (81)

Table 2: Unadjusted and adjusted ORs (95% CI) of predictors of childhood EBD

	Unadjusted Model Odds Ratios and 95% CIs	Adjusted Model Odds Ratios and 95% CIs
Child risk factors		
Male child	1.58 (1.38-180) ***	1.41 (1.21-1.65)***
Born before 37 weeks	1.67 (1.33-2.11) ***	1.46 (1.12-1.92)**
Difficult temperament as baby	2.43 (2.03-2.92) **	1.37 (1.10-1.72)***
Had a long term illness or disability at 3 years or 5 years	2.26 (1.97-2.59) ***	1.68 (1.43-1.97)***
Had a speech and language difficulty at 3 years or 5 years	2.22 (1.94-2.54) ***	1.61 (1.38-1.89)***
Had an emotional and/or behavioural problem at 3 years	7.96 (6.86-9.24) ***	3.88 (3.27-4.62) ***
Maternal risk factors		
Mother low level of attachment	2.03 (1.69-2.43)***	1.35 (1.08-1.68)**
Mother under 25 years at time of birth	2.70 (2.29-3.18) ***	1.52 (1.22-1.88)***
Mother smoked during pregnancy	1.99 (1.71-2.32) ***	1.02 (0.81-1.28)
Mother consumed alcohol during pregnancy	0.91 (0.77-1.09)	-
Mother drank alcohol hazardously when child was 9 months or when child was 3 years	1.55 (1.25-1.93) ***	0.92 (0.71-1.19)
Mother consumed illicit drugs when child was 9 months or when child was 3 years	2.02 (1.43-2.86)***	1.08 (0.70-1.65)
Mother suffered from depression when child was 9 months or 3 years old	2.63 (2.27-3.06) ***	1.15 (0.96-1.38)
Mother had a long term illness or disability when child was 9 months or 3 years	1.85 (1.59-2.15) ***	1.37(1.15-1.64)***
Mother was unemployed intermittently when child was 9 months or 3 years	1.68 (1.39-2.01) ***	1.20 (0.97-1.48)
Mother was continuously unemployed when child was 9 months and 3 years old	2.00 (1.71-2.34) ***	1.21 (1.00-1.47)
Mother education level - lower secondary or less	1.98 (1.70-2.31) ***	1.24 (1.01-1.50)*
Mother parenting style when child was 3 years-warmth	1.47 (1.19-1.81) ***	0.97 (0.75-1.24)
Mother parenting style when child was 3 years-hostility	3.85 (3.28-4.5) ***	2.05 (1.68-2.49)***
Mother parenting style when child was 3 years-consistency	3.09 (2.59-3.70) ***	1.74 (1.40-2.15)***
Mother stress levels when child was 3 years	3.78 (3.22-4.43) ***	1.94 (1.59-2.35)***
Paternal risk factors		
Father low level of attachment	1.14 (0.91-1.43)	-
Father had a long term illness or disability when child	1.03 (0.78-1.36)	-

was 9 months or 3 years		
Father suffered from depression when child was 9 months or 3 years old	1.50 (1.08-2.07)*	0.89 (0.60-1.30)
Father drank alcohol hazardously when child was 9 months or when child was 3 years	1.38 (1.12-1.71) **	1.38 (1.09-1.75)**
Father consumed illicit drugs when child was 9 months or when child was 3 years	1.34 (1.00-1.80) *	1.03 (0.71-1.48)
Father was unemployed intermittently when child was 9 months or 3 years	1.88 (1.4-2.26) ***	1.46 (1.10-1.93)**
Father was continuously unemployed when child was 9 months and 3 years old	1.15 (0.77-1.68)	-
Father parenting style when child was 3 years- warmth	1.03 (0.76-1.40)	-
Father parenting style when child was 3 years- hostility	2.12 (1.67-2.68) ***	1.18 (0.89-1.58)
Father parenting style when child was 3 years- consistency	1.64 (1.32-2.05) ***	1.12 (0.87-1.45)
Father stress levels when child was 3 years	2.24 (1.82-2.76) ***	1.38 (1.07-1.77) **
Family risk factors		
Conflict within the family	2.07 (1.66-2.58) ***	1.47 (1.14-1.91)***
Single parent household	2.76 (2.37-3.22) ***	0.92 (0.64-1.33)
Low income	1.90 (1.66-2.18) ***	1.03 (0.85-1.24)

- Variables significant at *** p<0.001, ** p<0.01, * p<0.05.
- Adjusted model is for all predictors identified in the analysis presented.