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The role of attachment style, resilience and mindfulness in men's mental health after the birth of their baby

by

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ABSTRACT

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THE ROLE OF ATTACHMENT STYLE, RESILIENCE AND MINDFULNESS IN MEN'S MENTAL HEALTH AFTER THE BIRTH OF THEIR BABY

Justyna Teresa Fila

Perinatal mental health problems in fathers have largely been omitted in existing literature until recently. As maternal perinatal mental health was found to have profound implications for their offspring it was important to establish whether fathers' psychological functioning is linked with children outcomes in a similar way. A review of studies investigating the relationships between various paternal psychological symptoms at different points in the perinatal period and a range of child outcomes was conducted. Evidence for a significant relationship between paternal postnatal depression in particular and children's emotional and behavioural functioning was found.

A longitudinal study of relationships between paternal psychological adjustment in the perinatal period with resilience, attachment style and mindfulness was conducted with a sample of 91 expectant fathers. It was found that the predictor variables were most strongly linked with fathers' antenatal psychological symptoms. Strongest predictors of fathers' postnatal mental health were their psychological symptoms during partners' pregnancy and their perceptions of labour and delivery. On the basis of this evidence a recommendation for routine antenatal screening of men for psychological symptoms and interventions focused on promoting resilience and mindfulness was made.

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DECLARATION OF AUTHORSHIP

I, JUSTYNA FILA declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

"The role of attachment style, resilience and mindfulness in men's mental health after the birth of their baby"

.....

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Definitions and Abbreviations

List of abbreviations in tables

ADBB -The Alarm Baby Distress Scale (Guedeney & Fermanian, 2001)

APPS - Antisocial Personality Problems scale from the Adult Self-Report DSM oriented scales.

ASQ - Ages and Stages Questionnaire (Quigg, Mahajerin, Sullivan, Pradhan, & Bauer, 2013)

AUDIT - The Alcohol Use Disorders Identification Test (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001)

BDI -Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961)

BSI -Brief Symptoms Inventory (Derogatis & Melisaratos, 1983)

CBCL -Child Behaviour Checklist (Achenbach, Edelbrock, & Howell, 1987)

CCEI - Crown Crisp Experiential Index (Birtchnell, Evans, & Kennard, 1988)

CES-D- Center for Epidemiological Studies Depression Scale (Radloff, 1977)

CRQ -Child Rearing Questionnaire (Sanson, 1995)

CTS -Carey Temperament Scale (Carey & McDevitt, 1978)

DAWBA -The Development and Well-Being Assessment (Goodman, Ford, Richards, Gatward, & Meltzer, 2000)

DOIs -Derived Outcome Indices (Sanson, Misson, & Wake, 2005)

DYAS -Dyadic Adjustment Scale (Spanier, 1976)

ECLSC -Early Childhood Longitudinal Study of Children (National Center for Education Statistics, 2000)

EPDS -Edinburgh Postnatal Depression Scale (Matthey et al., 2001)

FAD -Family Assessment Device (Byles, Byrne, Boyle, & Offord, 1988)

IBQ-R - Revised Infant Behavior Questionnaire (Gartstein & Rothbart, 2003)

ITSEA -The Infant-Toddler Social and Emotional Assessment (Carter, Briggs-Gowan, Jones, & Little, 2003)

Kessler-6 (Kessler, Barker, Colpe, & et al., 2003)

Marital conflict scale devised for ALSPAC (O'Connor, Cheng, Dunn, & Golding, 2005)

MSS -Marital Satisfaction Scale (Blum & Mehrabian, 1999)

PSS- The Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983)

PSRS -Provision of Social Resources Scale (Turner, Frankel, & Levin, 1983)

RRPS -Rutter revised pre-school scale (Elander & Rutter, 1996)

SCID -Structured Clinical Interview for DSM-IV (First, Spitzer, Gibbon, & Williams, 2012)

SCL-5 -The Hopkins Symptom Checklist (Tambs & Moum, 1993)

SDQ -Strengths and Difficulties Questionnaire (Goodman, 1997)

Chapter 1:

LITERATURE REVIEW

Fathers' mental health problems in the perinatal period and children's outcomes

Chapter 1

1.1 Introduction

Mental health problems in the perinatal period have been studied extensively in reference to mothers, often neglecting fathers in the process. One possible explanation is that historically in Western cultures fathers were not seen as having an important role to play in pregnancy, labour, infancy and early childhood (Parke & Sawin, 1976). As mothers were positioned as being more closely linked to their babies physically and emotionally, the potential impact of their mental disorders on their offspring was investigated closely. Also, many influential child development theories, such as psychodynamic and attachment theory positioned mothers as playing a key role in the childrearing process (Ramchandani & Psychogiou, 2009). There is now conclusive evidence that perinatal mental health problems in mothers are linked with adverse offspring outcomes such as physical health of the newborn, emotional and behavioural problems from infancy to adolescence, as well as social and cognitive development in childhood (Stein et al., 2014).

However, over the years, fathers' involvement in parenting has undergone a dramatic change (Marsiglio, 1995; Parke, 1996). Fathers started to take a much more active role in the perinatal period (Redshaw & Henderson, 2013). Thus, researchers began to investigate whether men also suffered from mental disorders during this time and examined their associations with child development. Prevalence of paternal postnatal depression, by far the most common paternal mental health problem in the perinatal period, is said to range between 1.2% and 25.5% in community samples (Goodman, 2004). In comparison, an average rate of depression for men is 4.8% (Paulson & Bazenmore, 2010). A recent meta-analysis of 43 studies estimated the rate of paternal depression in the first year of their child's life also at 10% (Paulson & Bazemore, 2010). Moreover, perinatal depression in mothers is closely linked with depression in their partners (Letourneau et al., 2012). Rates of this condition in men whose partners experience postnatal depression ranged between 24% and 50% (Zelkowitz & Milet, 2001). Other mental health problems such as anxiety, obsessive compulsive disorder (OCD), post-traumatic stress disorder (PTSD), bipolar disorder and psychosis are also present among fathers in the perinatal

period (Bradley & Slade, 2011). A question therefore arises as to whether there are similar links between paternal perinatal mental health problems and children's outcomes. A review of existing research into the relationship between paternal psychiatric disorders and child psychosocial development (throughout childhood, rather than in perinatal period) suggested that most psychiatric disorders impacting fathers are associated with an increased risk of behavioural and emotional difficulties in their children, especially in boys (Ramchandani & Psychogiou, 2009). The strength of the relationship was estimated to be similar in magnitude to that due to maternal psychiatric disorders (Ramchandani & Psychogiou, 2009). On the basis of the research into the impact of maternal depression on offspring (Goodman & Gotlib, 1999) Ramchandani and Psychogiou (2009) suggested a model of mechanisms through which paternal disorders may affect children (see Figure 1).

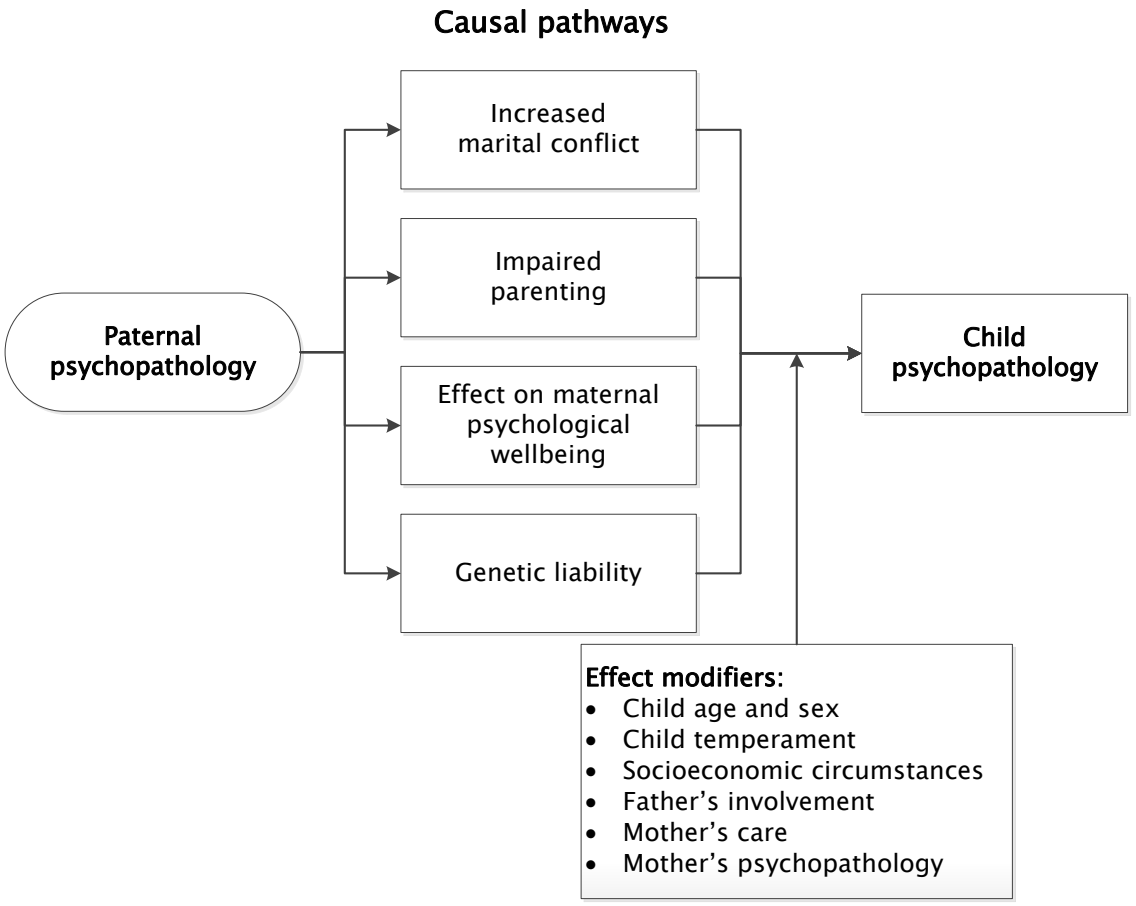

Figure 1: Proposed mechanisms of risk transmission from fathers to children as developed by Ramchandani and Psychogiou (2009) p. 648

The first suggested pathway is through genetic mechanisms, which vary in influence depending on the type of disorder (high in bipolar disorder, low in anxiety disorders). Paternal psychiatric conditions may also affect children through environmental mechanisms of transmission, as a disorder may impact on the whole family's lifestyle, maternal mental health, living conditions (through potential time off work and/or unemployment), ability to care for the offspring or how much time is spent with the child, as well as quality of marital relationship, all of which can impact on the child (Cummings, Keller, & Davies, 2005; Wilson & Durbin, 2010). The genetic and environmental factors may also interact, for instance when children of fathers with mental health problem are diagnosed with a psychiatric condition themselves. (Ramchandani & Psychogiou, 2009). Paternal psychiatric disorders are likely to influence

children through gene–environment correlation (where genetic risk might affect the choice of specific types of environments), and epigenetic effects (where environmental exposures might influence the subsequent expression of specific genes) (Gordon & Hen, 2004). These correlations are affected by several key variables such as child's sex, age, and temperament; as well as contextual factors, including socioeconomic status. These factors lead some children to be more vulnerable to the impact of paternal psychiatric illness, and others to be more resilient (Ramchandani & Psychogiou, 2009).

The aim of this review is to analyse the existing evidence about the associations between paternal mental health problems in the perinatal period and potential emotional, behavioural, and/or developmental problems their offspring may experience later on.

1.2 Literature Search

Published English language empirical studies were identified using PsycINFO via EBSCO and Medline via Ovid. The full search terms and the numbers of articles found are presented in Table 1. Thesaurus terms were used in order increase the relevance of the search results and to overcome the issue of inconsistent terminology and alternative terms and spellings. The reference sections of identified articles were also examined for additional relevant articles.

Table 1: Search terms

Database	Search subject terms (using Thesaurus)	Limits	Items found
PsychInfo via EBSCO	"Fathers" OR "father child relations" "Birth" OR "Postpartum depression" OR "Postpartum psychosis" OR" Postnatal period" OR "Pregnancy" "Infant development" OR "Parent Child Communication" OR "Parent Child Relations" OR "Parental Attitudes" OR "Parental Characteristics" OR "Parental Role" OR "Emotional Development" OR "Behavior Problems" OR "Child Psychopathology" OR "Emotional Adjustment"	English language only No dissertations	72
MedLine via OVID	"Fathers" OR "Father Child Relations" "Depressive disorder" OR "Child Behaviour Disorder" "Infant" OR "Pregnancy" OR "Postpartum Period"	English language Humans only	108
Search of reference lists	N/A	N/A	5

1.2.1 Study Inclusion and Exclusion Criteria

The review includes studies that used a standardised measure of a paternal mental health condition, which was either a screening or a diagnostic tool. Studies that investigated either fathers only, or both fathers and mothers, were included in the review. The included papers

also needed to incorporate a standardised measure of an aspect of the child's development and or wellbeing such as internalising or externalising behaviour, attention or temperament. More information about the specific measures used in the reviewed studies is provided below. Studies were excluded if the measure of a psychiatric disorder was not administered to fathers, if the participants' children were born prematurely, or were of low birth weight, or if the offspring were adopted. These papers were excluded as the development of infants who are born premature, of low birth weight, or adopted, is likely to be affected more by those factors than by the variables tested in these studies. Studies which analysed associations between alcoholism or other substance abuse and child outcome were also excluded to avoid obscuring the focus of the review on impact of mood disorders. The process of selection of the appropriate studies is illustrated in Figure 2 below.

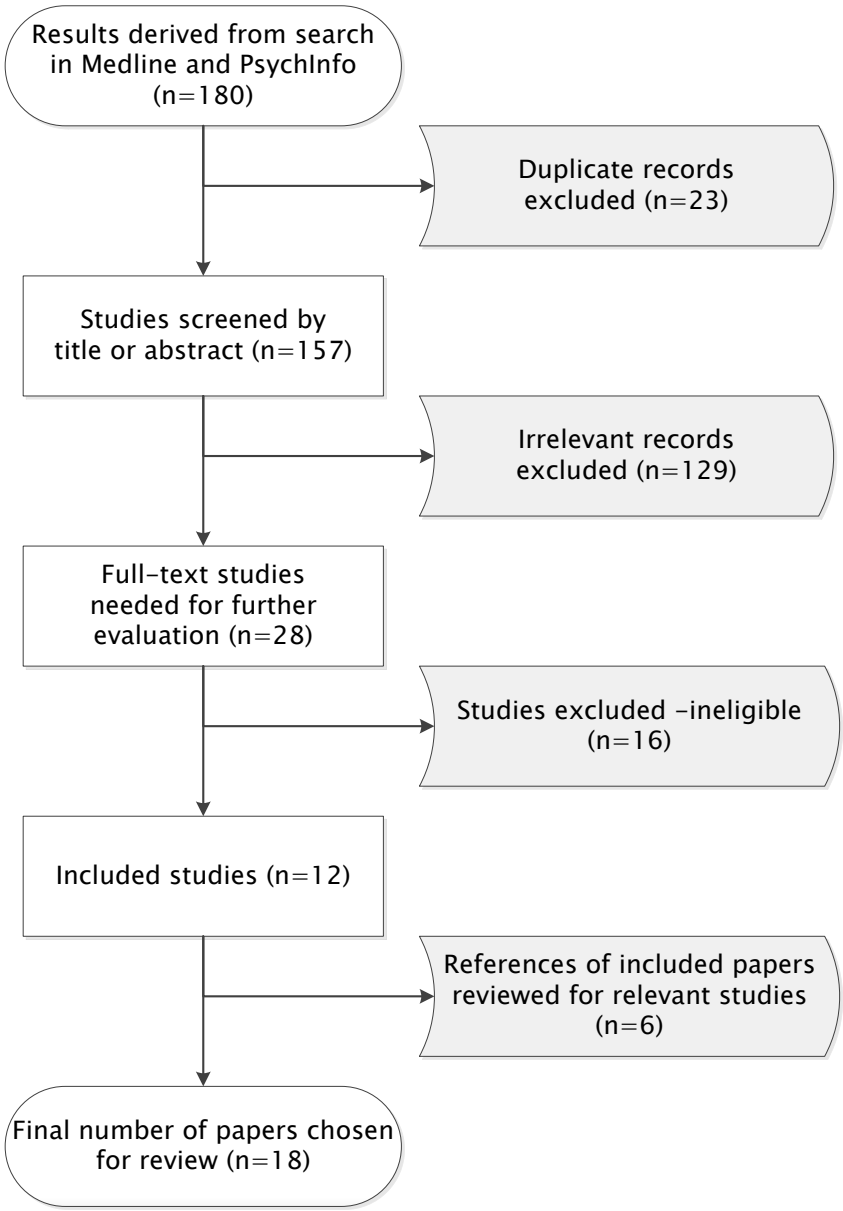

Figure 2: Flow chart of study selection process

1.3 Results

The search resulted in 18 studies that fit the criteria. The information about all the papers' authors, titles, population and design are included in Appendix A. Seven studies measured paternal mental health problems prenatally as well as postnatally. Eight studies conducted measurement of mental disorders among fathers in the postnatal period only, whereas three papers measured these variables only antenatally. Ten studies focused on paternal depression, two papers on depression and anxiety, one paper on depression and general non-psychotic mental health

symptoms, one on depression and hostility and four on psychological or global mental distress, which included measures of depression and anxiety symptoms. The most popular measure of parental symptoms used by 11 studies was the Edinburgh Postnatal Depression Scale (EPDS), which is a self-report questionnaire that consists of ten items. The EPDS was initially developed to screen for depression in women within the first six to eight weeks of giving birth, however it is also useful in the assessment of mothers across and beyond the first postnatal year and has been validated in men (Matthey, Barnett, Kavanagh, & Howie, 2001). Detailed information about the measures used in each study is provided in Tables 2, 3 and 4. As is evident from the tables, the instruments used to assess a mental health condition of participants vary across the chosen studies. However, they all focus on a relatively homogenous set of symptoms, including low mood, anxiety or anhedonia. On the other hand, there was more variability in the outcome variables investigated by the studies. The majority focused on emotional and behavioural problems, which were most often assessed by either the Strengths and Difficulties Questionnaire (Goodman, 1997), the Rutter revised pre-school scale (Elander & Rutter, 1996) or the Child Behaviour Checklist (Achenbach, Edelbrock, & Howell, 1987). Other outcomes measured included infant temperament, infant withdrawal symptoms, attention and language development. The structure of the analysis focuses on the child outcome measured in each study, rather than the different mental health problems of the fathers.

1.3.1 Emotional and behavioural problems

The strongest and best researched association is between paternal postnatal depression and children's behavioural problems and subsequent conduct disorders. One small study, from as early as 1993 (Carro, Grant, Gotlib, & Compas, 1993), pointed towards a positive association between fathers' postnatal depressive symptoms and their children's behavioural problems at age 2-3 years old. They also found that mothers' and fathers' depression jointly increased children's risk of developing internalising problems (Carro, Grant, Gotlib, & Compas, 1993). This was the first study

suggesting that fathers' postpartum depression may be linked to later child maladjustment, especially behavioural difficulties.

One of the biggest studies contributing further evidence for this was based on the data from The Avon Longitudinal Study of Parents and Children (ALSPAC), which was designed to collect a wide range of data on parents and their children from early pregnancy onwards. Pregnant women who were resident in Avon and had an expected delivery date between 1 April 1991 and 31 December 1992 were eligible to participate and the sample comprised 13,988 children (Golding, Pembrey, & Jones, 2001). The first paper analysing the data from the ALSPAC study relevant to this review looked at the link between postnatal paternal depression and children's emotional and behavioural problems at 3.5 years old (Ramchandani, Stein, Evans, & O'Connor, 2005). The positive association found was significant for emotional, conduct and hyperactivity difficulties; however, after controlling for social class, degree of education and maternal depression, the link with emotional problems was no longer significant (see Table 2 for odds ratios reported). The link between paternal depression and conduct problems and hyperactivity at 3.5 years old remained significant after controlling for paternal depression at 21 months post birth. However, the relationship between paternal mental health and the score for total problems on the Rutter revised pre-school scale was no longer significant at this stage. Interestingly, the relationship between paternal depression and child behaviour was stronger in boys than in girls. The analyses conducted here did not take into account prenatal depression; however, further investigations of the ALSPAC data (discussed below) addressed this limitation.

Considering depression during the prenatal as well as the postnatal period pointed towards a similar level of risk for children of fathers suffering from depression pre- and post-partum, but most importantly risk increased if paternal depression persisted from pregnancy to early childhood. One study based on the ALSPAC sample (Ramchandani, O'Connor, et al., 2008) compared the emotional and behavioural adjustment in children whose fathers were assigned to one of the four groups: non-depressed, only depressed prenatally, only depressed postnatally, or depressed throughout the perinatal period. In this way,

they were able to distinguish between prenatal and postnatal paternal psychopathology and compare direct (postnatal) exposure to paternal depression with indirect or latent (prenatal) exposure (genetic risk and also those life course patterns distinguishing depressed individuals) (Ramchandani, O'Connor, et al., 2008). The outcomes tested were behavioural problems at 3 years old and a likelihood of psychiatric diagnosis at age 7. The study found similar odds ratios in the prenatal only and postnatal only groups for a high level of behavioural and emotional problems at 3 years old, and for any psychiatric diagnosis at age 7. This suggests that latent risks may account for the increased rates of these difficulties where fathers experience depression. Another finding indicated that children whose fathers were more chronically depressed (pre and postnatally) had higher overall risks for adverse outcomes. Boys were more likely than girls to receive a diagnosis of oppositional defiant and conduct disorders at 7 years old if their fathers had experienced depression postnatally, or pre and postnatally, and if they were experiencing behavioural problems at the age of 3 years. This is probably the strongest indication that active exposure to the effects of paternal depression may be more significant than the latent risks transmitted. These conclusions may be affected by the limitations of the study, such as relatively low numbers in each of the depression groups (numbers equalling 89, 166 and 175) in comparison to the whole sample of the study (N=7601). This limited the power of the study to find differences between the groups, especially between the depressed groups. It is also important to note that the measure of depression used (EPDS) is a screening measure not a diagnostic tool, even though it has good sensitivity and specificity for a diagnosis of depression. The study used a cut-off score of 12 for depression, which meant that a participant who scored just below the cut-off at one time point and just above at the other may have experienced similar psychopathology at those times. Nonetheless, he would be rated as not depressed at one point and depressed at the other. However, this limitation was addressed by repeating the analyses with the use of continuous depression scores, which provided very similar findings, suggesting that the use of cut-off points did not result in artificial findings (Ramchandani, O'Connor, et al., 2008).

Further evidence for the relationship between postnatal paternal depression and subsequent behavioural problems and psychiatric diagnoses in their offspring is provided by another study using the ALSPAC sample (Ramchandani, Stein, et al., 2008). In contrast with the previous study (Ramchandani, O'Connor, et al., 2008), Ramchandani, Stein, et al. (2008) did not use a quasi-experimental design but measured depression and anxiety pre-, post- natally, and when children were 21 months old. They found that even after adjustment for maternal depression, children of fathers who experienced depression when they were 8 weeks old were more likely to experience problems with peers and were less likely to behave pro-socially at 6 years old. Moreover, these children's odds of receiving any psychiatric diagnosis at age 7 rose by 66% and were twice as high as those for oppositional defiant and conduct disorders. The association remained even when paternal depression when their children were 21 months was taken into account.

The link between postnatal paternal depression and emotional and behavioural problems in children is also supported by a study by Fletcher, Feeman, Garfield, and Vimpani (2011), who found that father's depression in the first year of the child's life was prospectively linked with increased risk of both emotional and conduct difficulties at between 4-5 years of age (as measured by both total and subscale scores of the Strengths and Difficulties Questionnaire (SDQ), even after controlling for socio-economic status, education and maternal depression. When paternal depression when children were 4-5 years old was controlled for, the link with early depression was still significant for the total difficulties score and for the hyperactivity and prosocial behaviour subscales. Interestingly, there was a difference between the outcome in boys and in girls. Early paternal depression was associated more strongly with boys' hyperactivity and prosocial scores and with girls' emotional, conduct and total difficulties scores. The study also analysed the overall development of children and found that those with depressed fathers were more likely to have poorer social, emotional and overall outcomes. In contrast with other research, this association was stronger in girls than in boys. It is important to note that Fletcher et al. (2011) used a very short measure of general paternal psychological distress (Kessler -6), featuring only 6 items assessing

depression and anxiety symptoms, rather than specifically a postnatal depression measure. This may have affected comparability of the results with previous studies.

The same measure was also used in a study by Giallo, Cooklin, Wade, D'Esposito, and Nicholson (2013), who found a relationship between paternal postnatal distress and increased emotional and behavioural difficulties for children at 5 years of age. However, this relationship was fully mediated by irritable parenting behaviour, which was operationalised as a high score on four items such as ""I have raised my voice with or shouted at my child" and "I have lost my temper with my child". Most importantly, these correlations remained significant after taking into account fathers' mental health status when children were 5 years old and mothers' postnatal mental health (Giallo et al., 2013).

Marital conflict is another important mediator between paternal depressive symptoms and children's emotional and behavioural problems. Hanington, Heron, Stein, and Ramchandani (2012) investigated the associations between parental depression in the perinatal period, also taking into account the marital conflict around that time. They found that both maternal and paternal depression was linked with adverse outcomes in children. Focusing specifically on fathers, postnatal depressive symptoms, as measured by the EPDS, predicted emotional and conduct difficulties when children were 3.5 years old. Importantly, marital conflict partially mediated this link. Moreover, both paternal depression and marital conflict in the antenatal period were associated with higher total problem scores on a measure of emotional and behavioural problems at 42 months old. Even though the study's design was strong, with a large sample and well validated measures of both depression and child outcome, it is important to note that there was a possibility of a response bias as fewer fathers than mothers responded at follow-up. It is therefore possible that the impact of paternal postnatal depression was underestimated as fewer depressed fathers were included in the final sample. Also, the study used mothers to provide reports of children's difficulties, which could be potentially biased as there was a possibility that depressed mothers were more likely to overestimate their children's problems (as a consequence of depressive psychopathology). Hanington et

al. (2012) identified marital conflict as one possible variable mediating the association between parental perinatal depression and child outcomes; however it only mediated the relationship partially and therefore left further possibilities of other variables which affect the relationship between paternal depression and child outcomes.

Further evidence for the mediating role of marital conflict in the relationship between paternal postnatal depression and later child behavioural problems comes from a study by Smith, Eryigit Madzwamuse, & Barnes (2013). Apart from measuring both parents' postpartum depression symptoms at 3 months and mental health symptoms when children were 3 years old, they also evaluated marital discord in the postnatal period using the Dyadic Adjustment Scale (Spanier, 1976). They found that paternal postnatal depression was a significant predictor of children's emotional and behavioural problems, as reported by mothers and fathers; however, when maternal depression was taken into account the association was only significant for fathers' reports. Furthermore, once paternal mental health problems when children were 3 years old were added to the analysis, the relationship between paternal postnatal depression and children's outcome was no longer significant. In the next step of the analysis, the relationship between fathers' mental health problems when children were 3 years old and their socio-emotional problems at over 4 years of age was investigated and was significant irrespective of socio-economic status, paternal postnatal depression and maternal mental health symptoms. This suggests that fathers' mental health in early childhood may have more impact on their children than in the postnatal year. One of the explanations cited by the authors indicated that this is due to increased paternal involvement in childrearing between ages of 2-5. However, possibly the most interesting finding of this study was that once marital discord when the child was 3 months old was taken into account, the relationship between paternal postnatal depression and child socio-emotional problems was no longer significant (Smith, Eryigit Madzwamuse, & Barnes, 2013). It therefore appears that marital discord in the postnatal period may be more significant risk factor for children, especially if fathers continue to experience mental health problems throughout their child's early and middle childhood. It is also important to

note that the measure used (General Health Questionnaire-12) to assess fathers' mental health symptoms included items about anxiety and other mental health problems in addition to measures of depression.

In contrast with studies suggesting there is a stronger relationship between fathers' depressive symptoms and emotional and behavioural problems for boys, Smith et al. (2013) provided evidence against the modifying effect of gender on the strength of the relationship between paternal mental health and child outcome. However, as the authors suggested, this may have been due to the use of a continuous scores on mental health and children's problems rather than clinical cut-off points, which would focus the analysis on individuals with marked difficulties. Finally, an important finding of this study was the lack of a significant relationship between paternal mental health and teacher reported problems (as per teacher version of the SDQ) in the offspring. One explanation is that children's problems are situation specific- mostly apparent at home and are exacerbated by marital discord. The authors also reported that there was no significant relationship between parents' and teachers' reports of children's difficulties on SDQ, again, indicating the specificity of the problems measured here (Smith et al., 2013).

The importance of marital conflict as well as maternal depression as mediators between paternal depression and child outcomes is further emphasised by Gutierrez-Galve, Stein, Hanington, Heron, and Ramchandani (2015) in their analysis of the ALSPAC data. Their results suggest that environmental factors, including maternal depression, couple conflict, and, to a lesser extent, paternal non-involvement, explain two-thirds of the total effect of paternal depression postnatally on child outcomes at 3.5 years, with maternal depression and couple conflict accounting for the majority of the mediation found. Similar associations were discovered in children at age 7, although, as predicted, the overall strength of the association decreased slightly over the follow-up period (see Table 2 for specific total effect sizes).

Parental hostility is another key variable mediating the link between perinatal depression and child outcomes. It was explored by Velders et al. (2011), who also investigated the link between children's emotional and

behavioural problems and paternal depression in the pre and postnatal period, including the mediating effect of parental hostility towards others. The analyses showed that prenatal depressive symptoms of mothers and fathers each predicted internalizing problems. However, these associations were no longer significant when prenatal parental hostility was added to the analysis. After incorporating postnatal psychopathology and hostility, the initially significant associations of postnatal depressive symptoms of mother and father with an increased risk of internalizing problems disappeared. Finally, poor family functioning experienced by the mother during pregnancy, postnatal maternal hostility, and postnatal paternal hostility were all independently associated with an increased risk of children's internalizing problems. The same pattern of associations was found for the links with externalising problems. Overall, postnatal symptoms of paternal and maternal hostility each significantly increased the likelihood of all subtypes of children's emotional and behavioural problems at the age of 3 years old (Velders et al., 2011). The findings emphasised the role of paternal hostility, which was similar to the link between maternal hostility and the likelihood of children's internalising and externalising problems. The authors suggested that this finding could be explained by the fact that depressed people present more nonverbal expressions of hostility in comparison to people who are not depressed (Velders et al., 2011).

The link between paternal mental health problems during pregnancy and children's emotional and behavioural problems is less evidenced, as only two studies in this review examined this association. Both of them were based on The Norwegian Mother and Child Cohort study (MoBa), which includes data about expectant fathers' mental health at 17th or 18th week of pregnancy, mothers' pre and postnatal mental health, and socio-emotional and behavioural development of the children at 3 years old (Kvalevaag et al., 2013). Kvalevaag et al. (2013) found a significant positive association between fathers' psychological distress during their partners' pregnancy and their children's subsequent behavioural and emotional difficulties as well as social functioning. More importantly, these relationships remained significant after adjustment for fathers' age, education marital status, somatic conditions, use of alcohol and cigarettes,

physical activity, as well as mothers' mental health. One of the possible explanations for this finding is a genetically transmitted risk to the child. However, another mechanism explaining it is the potential impact of paternal mental health problems on their pregnant partner, which might indirectly affect neonatal outcomes. A limitation of this study was that paternal postnatal mental health status was not measured (Kvalevaag et al., 2013).

Further analysis of data from MoBa focused on the relationship between paternal antenatal mental health and their offspring's aggressive behaviour at 18 months, 3 years and 5 years old (Kvalevaag et al., 2014). Paternal prenatal psychological symptoms of depression and anxiety were positively linked with a child hitting others at 5 years of age. When the analysis was adjusted for confounding variables such as fathers' age, education, marital status, and maternal mental health the association was only significant for 5 year old girls. The study also looked at whether children's language skills attenuated the relationship between paternal metal health and the likelihood of child hitting and found that adjustment for language skills increased the risk of hitting. Two variables which did have an attenuating effect on the link between fathers' mental health and hitting were paternal marital satisfaction and living with the father, which is in line with the results of the study by Hanington et al. (2012).

Chapter 1

Table 2: Details of studies on children's emotional and behavioural problems

Authors (Year)	N	Fathers' psychological symptoms (Measure used)	Time at which MH problem measured	Outcome in children (Measure used)	Age of children at follow up	Other variables measured (Measure used)	Results	Association differ for boys or girls?
Carro, M. G., Grant, K. E., Gotlib, I. H., & Compas, B. E. (1993)	70	Depression/ (BDI)	Prenatally at approx. 23 weeks gestation and postnatally at approx. 4.5 weeks	Internalising and externalising behavioural and emotional problems (CBCL)	24 and 36 months	Demographic information Marital satisfaction (DYAS) Perceived stress (PSS) Perceived Social Support (PSRS)	Fathers' symptoms were a significant predictor, whether entered before (sr2 = .14, p < .001) or after (sr2 = .11,p = .004) mothers' symptoms.	No
Ramchandani, P., Stein, A., Evans, J., & O'Connor, T. G. (2005)	10024	Depression (EPDS)	Postnatally at 8 weeks and 21 months	Children's emotional and behavioural problems (RRPS)	42 months	Demographic information Maternal depression (EPDS)	Paternal depression linked with increased risk of high total problems scores on the RRPS (OR 2· 19, 95% CI 1· 55–3· 08) and with high scores on all three problem subscales. When controlling for social class, degree of education, and maternal depression, link remained significant for conduct problems, hyperactivity, and total problems (2·09, 1·42–3·08),	The association between paternal depression and later behaviour (conduct) problems was stronger in boys than in girls (likelihood ratio test 5· 26, p=0· 022).

							but not for emotional symptoms. When controlling for depression in fathers at 21 months post-birth, the link between fathers' postnatal depression and conduct problems (1·73, 1·06–2·85) and hyperactivity(1·96, 1·12–3·43) in the children remained, but not for total problems.	
Ramchandani, P. G., O'Connor, T. G., Evans, J., Heron, J., Murray, L., & Stein, A. (2008)	7601	Depression (EPDS)	Prenatally at 18 weeks gestation and postnatally at 8 weeks after birth	Children's behavioural problems (RRPS) Psychiatric diagnoses (DAWBA)	40 months (RRPS) and 7 years old (DAWBA)	Demographic information	Children of fathers with depression had higher rates of total problems on the Rutter scales than children of father without depression (prenatal only 16.2% vs. 8.3%; unadjusted Odds Ratio 2.22 (95% Confidence Interval 1.34, 3.39); postnatal only 13.7% vs. 8.3%; unadj. OR 1.75 (1.07, 2.86); depressed at both times 24.3% vs. 8.3%; unadj. OR 3.55 (2.07, 6.08))	A significant interaction between postnatal exposure to paternal depression and child gender for the outcome of conduct problems (p = .030).
Ramchandani, P. G., Stein, A., O'Connor, T. G., Heron, J., Murray, L., & Evans, J. (2008)	5924	Depression (EPDS) Anxiety (CCEI)	Prenatally at 18 weeks and postnatally at 8 weeks, 8 months and 21 months	Children's emotional and behavioural functioning (SDQ) Psychiatric diagnoses	6 years (SDQ) and 7 years (DAWBA)	Demographic information Previous history of depression and family history of depression	Analysis adjusting for maternal depression in the postnatal period and fathers` educational level, shows a 66% increase in the odds for any psychiatric diagnosis (OR 1.66; 95% CI 1.05Y2.63; p = .030) and a near doubling of the odds of	No

				(DAWBA)			oppositional defiant/conduct disorders (OR 1.97; 95% CI 1.08Y3.58; p = .026) for children of depressed fathers. Similar association found on the basis of SDQ scores at 6 years old: peer problems (OR 1.46; 95% CI 1.13Y1.90; p = .004) and pro-social problems (OR 1.29; 95% CI 1.01Y1.66; p= .045) Analyses adjusting for depression at 21 months led to little attenuation in associations between depression in the postnatal period and child psychiatric disorders (any psychiatric disorder [OR 1.72; 95% CI 1.07Y2.77]) and specifically oppositional defiant/conduct disorders [OR 1.94; 95% CI 1.04Y3.61]) as well as association with peer problems scores on the SDQ (OR 1.37; 95% CI 1.04Y1.80).	
Fletcher, R. J., Feeman, E., Garfield, C., & Vimpani, G. (2011)	2620	Psychological distress (Kessler-6)	Postnatally when children were between 3-19 months	Behavioural and emotional problems (SDQ) Children's overall development	4-5 years	Demographic information Maternal depression (Kessler 6)	Early paternal depression was associated with an increased risk of a high SDQ total difficulties score (OR, 3.34; 95% CI, 3.06–3.65). Early paternal depression was associated with an increased risk of a low DOI	Early paternal depression was found to be more strongly associated with hyperactivity problems in boys than girls,

				and wellbeing (DOIs)			overall outcome score (OR, 2.70; 95% CI, 2.44–2.98) and was associated with lower scores on all of the DOI subscales. All results remained significant after adjustment for socio-demographics and maternal depression	but was more strongly associated with emotional problems in girls than boys. Early paternal depression was associated with poorer social/emotional and overall outcomes in children, and that this effect was stronger for girls than boys.
Giallo, R., Cooklin, A., Wade, C., D'Esposito, F., & Nicholson, J. M. (2013)	2025	Psychological distress (Kessler-6)	Postnatally when children were between 3-12 months and 4-5 years old	Behavioural and emotional problems (Total Difficulties scale of SDQ)	48 -60 months	Demographic information Parenting warmth (Modified 5 item subscale from CRQ) Parenting hostility (four adapted items from ECLSC)	Total indirect effect of postnatal distress on child outcomes via parenting variables (0.4, t=6.22, p<.001)	No
Gutierrez-Galve, L., Stein, A., Hanington, L., Heron, J., & Ramchandan	7058	Depression (EPDS)	Postnatally at 8 weeks and 8 months postpartum	Emotional and behavioural problems (RRPS and SDQ)	42 months (RRPS) 81 months (SDQ)	Parental age Parental education Couple conflict (ALSPAC devised scale)	The total effect of paternal depression postnatally on total child psychological problems at 42 months was 0.168 (95% confidence interval [CI]: 0.133–0.202; P , .001). This total effect was partitioned into 3 indirect	No difference by gender was found

i, P. (2015)						Paternal non-involvement (a question about frequency of father's involvement in 10 activities with their child, including bathing, singing, reading, and putting him/her to bed) History of trouble with police and suspension from school Alcohol and cannabis misuse	effects: 32.7% (0.055/0.168) was explained by maternal depression, 27.4% (0.046/0.168) by couple conflict, and 5.4% (0.046/0.168) by paternal non-involvement. The direct effect was 34.5% (0.058/0.168). The total effect of paternal depression on total child psychological problems at 81 months was 0.130 (95% CI: 0.098–0.161; P , .001). This total effect was partitioned into 3 indirect effects: 32.3% (0.042/0.130) was explained by maternal depression, 27.2% (0.035/0.130) by couple conflict, and 8.4% (0.011/0.130) by paternal non-involvement. The direct effect was 32.1% (0.042/0.130).	
Hanington, L., Heron, J., Stein, A., & Ramchandani, P. (2012).	13988	Depression (EPDS)	Antenatally at 18 weeks gestation and postnatally when babies were 8 months old	Emotional and behavioural problems (RRPS)	42 months	Demographic information Marital conflict (ALSPAC devised scale)	Postnatal paternal (OR 2.20, 95% CI 1.47–3.28) depression predicted total child problems. When marital conflict included (OR 1.98, 95% CI 1.31–2.99) Antenatal paternal (OR 2.34, 95% CI 1.70–3.23) depression predicted later total	No

							problems. When antenatal marital conflict was added to the models, the association between depression and child total problems decreased slightly (OR 2.17, 95% CI 1.54–3.05).	
Smith, H. R., Eryigit Madzwamuse, S., & Barnes, J. (2013)	543	Depression (EPDS) Non-psychotic mental health symptoms (GHQ-12)	Postnatally at 3 months (EPDS) and 36 months (GHQ-12)	Child behaviour (SDQ)	51 months	Demographic information Marital discord (DYAS)	Paternal postnatal depressive symptoms significantly predicted father-reported (r=.15, p<.001) and mother-reported child socio-emotional problems (r=.10, p<.001) Controlling for maternal symptoms paternal postnatal depression was only a predictor for father reports of child behaviour(r=.11, p<.001), and controlling for marital discord it was not significant for mother or father reports. Effect of postnatal paternal depression on child behaviour was not significant after controlling for paternal 36 month mental health	No

Velders, F. P., Dieleman, G., Henrichs, J., Jaddoe, V. W. V., Hofman, A., Verhulst, F. C., . . . Tiemeier, H. (2011).	2698	Psychological symptoms (BSI-mainly depression and hostility scales)	Prenatally at 20 weeks and postnatally at 3 years old	Child Behaviour - Internalising and externalising problems (CBCL)	3 years	Demographic information Family functioning (General Functioning Scale on FAD) Maternal smoking and alcohol use during pregnancy	Parental depressive symptoms increased the risk of child emotional and behavioural problems, but this increase was explained by postnatal parental hostile behaviour. Postnatal symptoms of hostility of mothers (OR = 1.34, p value\0.001) and postnatal symptoms of hostility of fathers (OR = 1.30, p value \0.001) each contributed independently to the risk of child emotional and behavioural problems.	No
Kvalevaag, A. L., Ramchandani, P. G., Hove, O., Assmus, J., Eberhard-Gran, M., & Biringer, E. (2013)	28703	Global mental distress, mainly symptoms of anxiety and depression (SCL-5)	Prenatally at 17 or 18weeks gestation	Socio-emotional and behavioural development (SDQ, ITSEA, CBCL)	36 months	Demographics: fathers' age, level of education, marital status Self-reported somatic health problems Lifestyle variables such as cigarette smoking and use of alcohol Mothers' pre and postnatal mental health (SCL-5)	A positive association found between fathers' psychological and children's behavioural difficulties at 36 months of age: crude B = 0.19 (95% confidence interval [CI] = .15–.23), P = .000; children's emotional difficulties: B = 0.22 (95% CI = 0.18–0.26), P = .000, and social functioning: B = 0.12 (95% CI = 0.07–0.16), P = .000	No

Kvalevaag, A. L., Ramchandani, P. G., Hove, O., Eberhard-Gran, M., Assmus, J., Haavik, O. E., Biringer, E. (2014)	28703	Global mental distress, mainly symptoms of anxiety and depression (SCL-5)	Prenatally at 17 or 18weeks gestation	1 item from CBCL "Hits others"	18 months 3 years 5 years	Demographics: fathers' age, level of education, marital status Self-reported somatic health problems Lifestyle variables such as cigarette smoking and use of alcohol Mother's mental health (SCL-5), fathers relationship satisfaction (5 items from MSS), childredn's language skills (2 items from ASQ)	Significantly higher crude risk of children hitting at 5 years of age when expectant fathers reported high level of psychological distress; odds ratio (OR) = 1.34, 95 % confidence interval (CI) = 1.05–1.72, p = 0.019. After adjustment for the covariates, this increased risk was no longer significant; fully adjusted OR = 1.24, 95 % CI 0.96–1.60, p = 0.100 The OR for hitting others at 5 years in the total sample was OR = 1.78 (95 % CI 1.53–2.08), p = 0.000 and OR = 1.87 (95 % CI 1.68–2.09), p = 0.000, respectively, when adjusted for expressive and impressive language function.	Significant higher risk of girls hitting at 5 years of age when the fathers reported high level of psychological distress, adjusted OR = 1.46 (95 % CI 1.01–2.12), p = 0.043; but not for boys, adjusted OR = 0.1.03 (95 % CI 0.72–1.47), p = 0.860.

1.3.2 Infant characteristics and temperament

The studies discussed above investigated the links between paternal perinatal depression and children's emotional and behavioural problems. This section focuses on the associations between paternal perinatal mental health and infant characteristics and temperament.

There is some evidence that postnatally depressed fathers perceive their infants as having more difficult temperaments than fathers not experiencing postpartum depression. Hanington, Ramchandani, and Stein (2010) analysed the links between paternal postnatal depression and child temperament, defined as mood and intensity of reactions measured by the Carey Temperament Scale (Carey & McDevitt, 1978) items such as "She lies quietly in the bath" at 6 months and two years old. They found that children of depressed fathers had more difficult temperaments, operationalised as higher scores on the Carey Temperament Scale, than children of non-depressed fathers. However, this finding was only significant for boys. It is important to note however, that in this study the reports of child temperament were provided by mothers, some of whom were also experiencing depression. In theory, it was possibly more likely that these mothers would rate their babies' temperament as more difficult than non-depressed mothers due to depressive psychopathology (Hanington et al., 2010). Another study (Ramchandani et al., 2011) focusing on infant temperament and family functioning found that fathers who experienced depression at 7 weeks postpartum reported their 3 months old babies as more distressed than non-depressed fathers, especially if they were still experiencing a depressive disorder at 3 months. The strongest association between these variables was found when continuous score on the EPDS was used rather than a cut-off score. In contrast with the previous study (Hanington et al., 2010), the differences found here were significant for both boys and girls. However, it is important to note that the data from Ramchandani et al's (2011) study was cross-sectional and from a smaller sample.

A final study (Davé, Nazareth, Sherr, & Senior, 2005) investigating infant temperament found a strong association between more negative paternal mood and difficult infant temperament, when babies were 4-6 weeks old.

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This study's aim was to investigate the links between postnatal depression and infant temperament; however, due to a very low sample size (n=48) and the fact that only a small percentage of participants could be classified as depressed (4/48), no meaningful comparisons could be made. There were also very low numbers at follow up (n=17), none of whom were depressed, therefore it was not possible to report any significant changes over time (Davé et al., 2005).

Table 3 : Details of studies on infant characteristics and temperament

Authors (Year)	N	Fathers' psychological symptoms (Measure used)	Time at which MH problem measured	Outcome in children (Measure used)	Age of children at follow up	Other variables measured (Measure used)	Results	Association differ for boys or girls?
Davé, S., Nazareth, I., Sherr, L., & Senior, R. (2005)	48	Depression (EPDS) Depression and anxiety (HADS) Depression and anxiety (Brief PHQ)	Postnatally 4-6 weeks (HADS and EPDS) and 6 months (PHQ-9)	Infant temperament (ICQ)	6 months	Couple relationship dynamics (DYAS) Father-child interactions and attitudes (FCAS) Alcohol Use (AUDIT) Stressful Life Events (RLEQ)	A strong association was found between more negative paternal mood and difficult infant temperament (fathers with relatively higher depressed mood had infants with, on average, a 3-point higher infant fussiness score). This effect remained after controlling for the effects of confounders	No
Hanington, L., Ramchandani, P., & Stein, A. (2010)	13988	Depression (EPDS)	Postnatally at 6-8 months and at 21-24 months	Child temperament (CTS)	6 months and 24 months	Demographic information	Paternal depression at Time 1 significantly predicted both child mood (Beta = 0.049; $p < 0.001$) and intensity (Beta = 0.038; $p = 0.003$) at Time 2.	When data split by gender, father to child effects significant only for male children
Ramchandani, P. G., Psychogiou, L., Vlachos,	153	Depression (EPDS) Major	Postantally at 7 weeks and 3 months	Infant temperament (IBQ)	3 months	Demographic information Fathers' antisocial	Weak evidence that fathers in depressed group perceived their infants as more distressed compared	Difference was significant for both boys (M= 4.33, SD=1.06;

H., Iles, J., Sethna, V., Netsi, E., & Lodder, A. (2011).		Deppressive Disorder (SCID)				traits (APPS) Fathers' alcohol usage (AUDIT) Parents' couple relationships (DYAS) Perceived criticism in couple relationship (2 self-report items)	to the non-depressed fathers (t= -1.89, p= .061). Comparing only fathers with current depression with non-depressed fathers: those with depression reported more distress in their infants (M=4.25, SD=.88; M=3.61, SD=.73; t(115)= -3.38, P=.001). Analyses using continuous scores for depressive symptoms at 3 months show that high levels of depressive symptoms were associated with the fathers' reports on the infant's distress temperament scale (r=.273, P<.001) and with maternal reports on the infant's activity scale (r=.168, P=.021).	M=3.66, SD =.75; t(49)=-2.07, P=.044) and girls (M =4.20, SD=.81; M=3.56, SD=.72; t(64)=-2.720, P=.008).

1.3.3 Other types of outcomes in children

Three studies found for this review investigated a selection of different outcomes in children of depressed fathers. Even though each variable is only investigated by one study, they represent a scientific exploration of possible outcomes that may be related to perinatal mental health. For instance, there is some evidence for a link between paternal postnatal depression and reduced expressive language in children through a reduction in frequency of reading to offspring (Paulson, Keefe, & Leiferman, 2009). Paulson et al. (2009) found that both maternal and paternal depression was negatively correlated with parent to child reading frequency. However, fathers' early depression predicted decreases in reading frequency 15 months later and relatively reduced child expressive language at age 2. It is important to note that depression in this study was only measured once, when children were 9 months old, and therefore it is not known how changes in depressive symptoms and possible remission affected the findings. Moreover, parent to child reading is only one of many possible ways in which parents can stimulate their children's language development. Also, only reading frequency and not quality was measured. All variables in the study, including children's vocabulary were collected using parental self-report, which may have affected the validity of the data. Finally, 24 months is a very early stage of expressive language development, and children at this stage usually have better developed receptive language, which was not measured in the study (Paulson et al., 2009).

The exploration of a relationship between paternal antenatal mental health and children's attention appears to suggest that other factors, such as maternal mental health in pregnancy or parental anxiety at the time of testing, are more significant. One paper discussed the link between parental depressive and anxiety symptoms during pregnancy and children's attention problems (Van Batenburg-Eddes et al., 2013). The study was based on data from two prospective population-based studies: Generation -R in the Netherlands and ALSPAC. In both cohorts the correlations between paternal mental health symptoms and children's attention problems were weaker than for maternal symptoms. In ALSPAC,

the association between paternal depression and child attention problems was stronger than in Generation- R. However, most of the association between prenatal parental depression and anxiety and child attention was mediated by parental anxiety symptoms when children were 3 years old (Van Batenburg-Eddes et al., 2013).

One study in this review investigated the links between paternal postnatal depression and infant social withdrawal symptoms (Luoma et al., 2013), however, this association was insignificant. This was even when continuous scores on EPDS were used in the analysis.

Table 4 : Details of studies on other outcomes in children

Authors (Year)	Sample size	Fathers' psychological symptoms (Measure used)	Time at which MH problem measured	Outcome in children (Measure used)	Age of children at follow up	Other variables measured (Measure used)	Results	Association differ for boys or girls?
Luoma, I., Puura, K., Mäntymaa, M., Latva, R., Salmelin, R., & Tamminen, T. (2013)	194	Depression (EPDS)	Postnatally at 4, 8 or 18 months	Infant's withdrawal symptoms (ADBB)	8 or 18 months	Demographics, difficulties at work, perceived general and mental health, tobacco and alcohol consumption, perceived quality of the pair relationship, occurrence of domestic violence (multiple choice and open-ended questions)	The association between the infants ' social withdrawal and fathers ' depressive and anxiety symptoms did not show statistical significance.	No
Paulson, J. F., Keefe, H. A., & Leiferman, J. A. (2009)	4109	Depression (CES-D)	Postnatally at 9 months	Child expressive vocabulary (50-item subset of the word list from MCDI-SF)	24 months	Demographic information Parent to child reading at 9 months and 24 months (multiple option question)	Expressive vocabulary was linked to both parents' reading behaviour at 24 months, with father's reading (t = 4.58, p < .01,b = .54) having a slightly larger effect than mother's (t = 2.76, p = .01, b = .43). Father's depression was negatively linked (t = 2.34, p = .02, b =).11) with children's	No

							expressive language.	
Van Batenburg-Eddes, T., Brion, M. J., Henrichs, J., Jaddoe, V. W. V., Hofman, A., Verhulst, F. C., Tiemeier, H. (2013).	Generation R - 2280 ALSPAC 4019	Generation R: Symptoms of depression and anxiety (BSI) ALSPAC: depression (EPDS)	Prenatally at 20 weeks (BSI) or 18 weeks (EPDS)	Attention problems: Generation R (Attention Problems Scale on CBCL) ALSPAC (hyperactivity /inattention subscale from SDQ)	Generation R -3 years ALSPAC -4 years	Generation R- demographic information, maternal smoking and alcohol use during pregnancy ALSPAC -infant gender, birth weight, demographic information, maternal smoking and alcohol use during pregnancy	The association between paternal depression and attention problems was only significant in ALSPAC cohort (OR=1.22 CI(1.10-1.35), p,.001). When adjusted for confounders OR=1.11, CI (1..00-1.24, p=.05). After adjusting for symptoms 3 years after the child was born the association was not significant.	No

1.4 Discussion

1.4.1 Interpretation of findings

On the basis of the studies reviewed here, there appears to be important evidence for an association between paternal postnatal depression and children's emotional and behavioural problems (Carro et al., 1993; Fletcher et al., 2011; Ramchandani, O'Connor, et al., 2008; Ramchandani et al., 2005; Ramchandani, Stein, et al., 2008), irrespective of mothers' mental health and confounding variables such as education or socioeconomic status. The evidence is particularly strong for the relationship with behavioural problems of boys in particular (Ramchandani, O'Connor, et al., 2008). However, the picture becomes more complex when we consider studies that attempted to identify a mediating variable for these associations, such as marital conflict (Gutierrez-Galve et al., 2015; Hanington et al., 2012), marital discord (Smith et al., 2013) or paternal hostility (Velders et al., 2011). When these variables were taken into account the relationship between depression and children's outcomes was partly attenuated or no longer significant. These findings are difficult to interpret with certainty without further research; however, there are some potential explanations. Firstly, it may be that fathers who are depressed find it more difficult to experience marital satisfaction and / or exhibit positive parenting behaviours, which in turn has an impact on their children's wellbeing. There is also a possibility that parents who experience a lot of marital conflict and dissatisfaction or generally behave in a hostile manner develop depression after the birth of their baby, which then affects their child. Moreover, there is evidence of higher rates of conflict with partners among depressed parents after the birth of their child than antenatally (Hanington et al., 2012), although destructive tactics appear to have more impact on infants than the frequency of couple conflict (Goodman & Gotlib, 1999). It seems that it is the qualitative characteristic of parents' conflict such as specific ways of handling the arguments that has an impact on children's functioning. For instance, constructive conflict tactics (such as problem solving, verbal affection, physical affection) are positively associated with improved children's functioning, whereas destructive conflict tactics (verbal aggression, nonverbal anger, withdrawal) are

associated negatively with child outcomes over time (McCoy, Cummings, & Davies, 2009).

In the studies reviewed here the relationship between postnatal depression and child outcomes was sometimes attenuated when fathers' psychological symptoms around the time when child outcome was tested were taken into account (Ramchandani, Stein, et al., 2008; Smith et al., 2013). One possible explanation for this is that the potential impact of paternal mental health problems later on in a child's life is even greater than in the perinatal period, due to the increased involvement of fathers in childrearing (Smith et al., 2013).

The evidence for the relationship between antenatal mental health problems and child outcomes is much more limited and the associations rarely remained significant after confounding variables, and especially, postnatal parental mental health were taken into account (Kvalevaag et al., 2013; Kvalevaag et al., 2014; Ramchandani, O'Connor, et al., 2008).

There is some limited evidence for a link between paternal perinatal mental health and other child outcomes, such as infant temperament (Davé et al., 2005; Hanington et al., 2010; Ramchandani et al., 2011). However, these are significantly limited by methodological issues such as cross-sectional designs or low sample sizes. Only Hanington et al.'s (2010) study was both methodologically strong and found significant associations between boys' temperament and paternal postnatal depression.

There were also some individual studies investigating the relationship between paternal perinatal mental health and language development (Paulson et al., 2009), attention difficulties (Van Batenburg-Eddes et al., 2013) and infant withdrawal symptoms (Luoma et al., 2013); however, the results of these were either insignificant or strongly affected by methodological issues.

Some studies attempted to identify a gender effect on the associations found and it appeared that paternal mental health had stronger association with the outcomes of their sons, apart from two studies where there were different outcomes for boys and girls (Fletcher et al., 2011),

stronger associations with overall development and wellbeing of girls (Fletcher et al., 2011) and physical aggression in girls (Kvalevaag et al., 2014).

Generally, the strength of associations found in these studies was lower than those found between maternal perinatal mental health and children outcomes (Fletcher et al., 2011; Stein et al., 2014).

1.4.2 Methodological considerations

The majority of the studies in this review had longitudinal, observational designs and were based on very large samples, which enabled them to identify significant associations more easily. However, such designs also have their limitations. Firstly, they are not able to identify causality or the directionality of the relationship. Moreover, there is often a large dropout rate that is generally disproportionately high among depressed fathers, thus potentially underestimating the strength of the measured association. Moreover, as the majority of studies were population rather than clinical samples, the reported effect sizes were relatively small. Another important issue regards the validity of self-report measures for assessment of parental mental health and parent report measures for evaluation of the children's outcomes. This is very important as it is more likely that depressed parents will overestimate the level of difficulties in their children, as was illustrated by a discrepancy between parents' and teachers' reports of child difficulties in one of the studies (Smith et al., 2013). However, without a triangulated measure it is impossible to know which informant was more accurate. It may be that the discrepancy was due to situational factors and if the teachers observed the children at home their reports might have been more aligned with those of the parents.

A further important issue in the majority of the studies reviewed here was that most of the children participating in these research projects were relatively young (at most 7 years old). This may be related to the fact that research into paternal perinatal mental health is relatively novel. However, it is important to consider the sensitivity of the outcome measures for this age group. Some studies (Ramchandani, O'Connor, et al., 2008;

Ramchandani, Stein, et al., 2008) attempted to predict the increase in the likelihood of a psychiatric diagnosis in children as young as 6 or 7 years old. Such an approach may be problematic. Firstly, psychiatric problems are uncommon in primary school aged children relative to older children or adolescents (Lewinsohn, Rohde, & Seeley, 1998; Lewinsohn, Shankman, Gau, & Klein, 2004). Although, this problem can be addressed with adequate sample sizes, which was the case in the studies mentioned. Secondly, there is a question to be answered about how ethical it is to attempt to give a child as young as 6 or 7 years old a psychiatric diagnosis. Psychological distress at such a young age is frequently a natural response to difficult systemic factors. Assigning a label to it places a problem "inside" the child and may limit of opportunities for addressing systemic factors (Dallos, 2006). On the other hand, some children may benefit from an intervention which may only be available following a diagnosis. Finally, studying internalising and externalising difficulties in children aged 0-7 years may lead to an underestimation of the effects of parental mental health in the perinatal period on child outcomes. The negative impact of such experiences may not be evident until adolescence and therefore it may be beneficial to also test child outcomes at that stage.

As mentioned before, even though the standardised measures used to assess paternal mental health varied between studies, most of them depicted various symptoms of depression and/or anxiety and general psychological distress. There were no identified studies investigating the relationship between other mental health conditions in the perinatal period, such as PTSD, OCD, psychosis etc. and child outcomes. This may be because the rates of these disorders are likely to be lower than these of depression and anxiety (Bradley & Slade, 2010), and therefore recruitment of clinical samples is more challenging. However, it would be beneficial to conduct further research into the potential links with other mental health conditions.

1.4.3 Limitations

One of the limitations of this review is that the effect sizes were unavailable for some studies. This was due to the fact that not all

reviewed studies published effect sizes and the statistics needed for their calculation were not always readily available. Secondly, certain measures of quality of the studies were not analysed in this review. The PRISMA (Moher, Liberati, Tetzlaff, Altman, & The, 2009) and PRISMA-P (Shamseer et al., 2015) guidelines recommend that the possibility of publication bias be assessed as well as the risk of bias across the studies, such as selective reporting.

It is important to note that it was not aimed to conduct a full systematic review but rather a review with a systematic literature search strategy. Finally, due to the timescale and funding limitations, the synthesis of results such as a meta-analysis, including confidence intervals and measures of consistency was not conducted (Moher et al., 2009; Shamseer et al., 2015). These limitations mean that one cannot be certain that the information presented here is fully comprehensive or unbiased.

Direction of future research

Even though the evidence available in the reviewed studies is inconsistent and requires further research, it provides a strong indication that paternal mental health problems may be linked to certain negative children outcomes, similar to those found with maternal perinatal mental health problems. However, further research attempting to investigate possible causal pathways in the associations between paternal perinatal depression and children's outcomes are certainly needed. These could focus on a wider range of mediating variables, including the possible risk transmission pathways suggested by Ramchandani and Psychogiou (2009), such as impaired parenting and the impact on maternal psychological wellbeing of paternal psychopathology. For instance, paternal antenatal and postnatal mental health problems affect father-infant interaction through more negative patterns of speech (Sethna, Murray, & Ramchandani, 2012) or less responsive verbal and nonverbal patterns (Parfitt, Pike, & Ayers, 2013). This is one of the ways in which fathers' parenting style is affected by depression and constitutes a possible pathway to the development of cognitive vulnerability to depression in the child (Sethna et al., 2012). Furthermore, disengaged, less sensitive interactions between fathers and their infants in the first three months

were related to later behavioural problems (Ramchandani et al., 2013; Trautmann-Villalba, Gschwendt, Schmidt, & Laucht, 2006). Intervention trials could also be a way to establish causality; however, these are challenging to undertake and the findings to date are often mixed. A further challenge exists in separating the genetic from environmental transmission pathways (Ramchandani & Murphy, 2013).

It is also important to remember that depression is associated with many other types of adversity in life, and so may be acting as a risk marker, rather than a causal risk factor. Forgetting this may lead to simplistic, and usually only partially effective, solutions, as treating only parental depression may miss other key difficulties that need addressing (socio-economic difficulties, comorbid substance abuse etc.) (Ramchandani & Murphy, 2013).

1.4.4 Clinical implications

Overall, these findings highlight the importance of recognizing and treating depression in fathers during the perinatal period (screening programs for both mothers and fathers in the postnatal period should be considered), considering both parents when one parent presents with depression, assessing the family environment and functioning with appropriate interventions to enhance the couple and family relationships, and considering the potential for targeted parenting programs to help parents understand their children's needs and to prevent child psychopathology (Gutierrez-Galve et al., 2015).

Chapter 2:

EMPIRICAL PAPER

The role of resilience, attachment style and mindfulness in fathers' mental health in the perinatal period.

2.1 Importance of fathers' mental health in the postnatal period

Over the course of a generation there has been a cultural shift in fathers' involvement in preparation for the arrival of their offspring, such as attending antenatal classes, supporting the mother in labour, and actively sharing with the mother the responsibilities of caring for the newborn child (Draper & Ives, 2013). This has helped fathers establish closer relationships with their children as well as their partners and feel more involved in family life (Dienhart, 1998; Draper, 1997; Haas & Hwaang, 2008; Marsiglio, 1995). For many fathers this is a positive experience with pride, happiness, excitement and a sense of improved family relationships (Chalmers & Meyer, 1996). At the same time the research suggests that some men struggle with the transition to fatherhood. For instance, fathers who are present at birth of their baby but experience the event as negative or difficult are more likely to suffer from psychological distress postnatally (Greenhalgh, Slade, & Spiby, 2000). However, regardless of presence during the delivery, some fathers suffer with postnatal depression, anxiety, PTSD as well as other mental health problems following the arrival of their child (Bradley & Slade, 2011; Schumacher, Zubaran, & White, 2008).

Therefore, the question arises about factors which determine whether fathers adjust well to the arrival or their offspring or experience mental health problems during this transition. This becomes particularly important when we take into account the prevalence of paternal perinatal psychiatric conditions. For instance, postnatal depression, by far the most common paternal mental health problem in the perinatal period, ranges between 1.2% and 25.5% in community samples (Goodman, 2004). In a meta-analysis of 43 studies the estimated rate of paternal depression in the first year of their child's life was 10% (Paulson & Bazemore, 2010). Moreover, it has been shown that perinatal depression in mothers is closely linked with depression in their partners (Letourneau et al., 2012). Among men whose partners experience postnatal depression the rate of this condition ranged between 24%-50% (Zelkowitz & Milet, 2001). The rates of paternal post- traumatic stress disorder (PTSD) symptoms in

postnatal period ranged between 5% -11.6% on at least one dimension including intrusion, avoidance or hyperarousal (Bradley & Slade, 2011; Bradley, Slade, & Leviston, 2008), indicating that for some men the arrival of their offspring may be a traumatic experience.

The importance of these statistics goes beyond the human suffering experienced by distressed parents, as perinatal mental health problems may have consequences for the children as well. Even though the majority of research focuses on the relationship between maternal psychological problems and offspring outcomes (T. M. Field, 2010; Stein et al., 2014), fathers' experience of psychological difficulties such as depression can also have major implications for the quality of their relationships with their children (Ferketich & Mercer, 1995) as distress can affect men's bonds with their infants (Buist, Morse, & Durkin, 2003).

The previous chapter focused on reviewing available evidence for potential consequences of paternal perinatal mental health problems on their offspring. Even though more research is necessary to establish the strength and details of the relationship between fathers' psychological symptoms related to childbearing and the children's outcomes, there are some strong indications that paternal depression in particular may be a significant risk factor linked to the offspring's emotional and behavioural development (Fletcher et al., 2011; Ramchandani, O'Connor, et al., 2008; Ramchandani et al., 2005; Ramchandani, Stein, et al., 2008).

2.2 Risk versus protective factors

As paternal perinatal psychological problems can potentially have such significant consequences from an individual as well as a population point of view, a more detailed understanding of them is crucial scientifically and clinically in order to aid prevention. However, the majority of current research focuses on establishing the prevalence and the risk factors for the occurrence of various postnatal mental health problems rather than establishing which factors support men in having a more positive experience in the perinatal period. For instance, high neuroticism, introversion, experiencing distress during partner's labour, difficulties in a relationship, deficient social networks, unplanned pregnancy as well as

some demographics, such as fewer educational qualifications, being unemployed or in lower skilled job are correlated with postnatal depression in men (Bradley & Slade, 2011; Bradley et al., 2008; Schumacher et al., 2008; Tuszyńska-Bogucka & Nawra, 2014). However, this approach to identifying various risk factors is too broad and general and does little to aid the development of effective interventions and inform clinicians working with families during the perinatal period.

An important reason for focusing on protective rather than risk factors comes from research suggesting that the presence of reliable resources and ability to draw on them in times of adversity is more likely to lead to healthy wellbeing than the absence of risk factors (Friborg, Hjemdal, Rosenvinge, & Martinussen, 2003). Nonetheless, the protective factors against postnatal mental health problems in men are not as well explored despite promising results of preventative interventions for mothers (Elliott et al., 2000; Sockol, Epperson, & Barber, 2011). However, literature on coping with difficult situations focuses on the concept of resilience which can be described as an umbrella term for explaining why some people cope well in the face of adversity (Rutter, 1987, 2013). Another strand of research into protective factors highlights that a person's attachment style affects coping strategies. Insecure attachment styles are linked to both prenatal and postnatal depression as well as anxiety disorders in women (Figueiredo, Bifulco, Pacheco, Costa, & Magarinho, 2006; Kuscu et al., 2008) and play a crucial role in maternal adjustment during the perinatal period (Findler, Taubman-Ben-Ari, & Jacob, 2007). Finally, most recent developments in the area of coping with adversity identify mindfulness (Kabat-Zinn, 1990) as a significant protective factor. It is said that mindful individuals orient to ongoing events and experiences in a receptive, attentive manner. Such an experiential way of dealing with events has implications for the perception of, and response to, stressful situations (Weinstein, Brown, & Ryan, 2009). All the identified protective factors are discussed in more detail below.

2.2.1 Resilience

As mentioned above, one of the best known protective factors is resilience, which has been described as the ability to stay positive in

adverse situation, rather than not experiencing distress or denying it (Music, 2011). A biopsychosocial model of mental resilience (Davydov, Stewart, Ritchie, & Chaudieu, 2010) assumes that, in order to survive a psychological challenge, the system should have in-built mechanisms able to recognize and neutralize adversities and their related effects. These resilience mechanisms may be innate, or may have been developed either naturally through individual adaptation, or artificially through external influences such as public health activities (Davydov et al., 2010). Some researchers suggest that resilience includes three major characteristics: individual positive dispositional attributes, family support and coherence, and external support systems outside the family (Werner, 1992; Werner & Smith, 1992). On these bases it was found that higher levels of protective resilience factors have been linked to lower levels of psychological symptoms and at times to the absence of psychopathology (Friborg, Hjemdal, Martinussen, & Rosenvinge, 2009; Hjemdal, Aune, Reinfjell, Stiles, & Friborg, 2007). Overall, resilient individuals cope with stressful life events in a more functional and flexible way by using family, social and external support systems effectively (Friborg et al., 2003). It also appears that a degree of practice in using resilience resources in stressful situations is crucial in successful coping with adversity. For instance, Neff and Broady (2011) examined stress resilience following the transition to parenthood in a sample of newlywed couples. Spouses who experienced moderate stress during the early months of marriage and had good initial relationship resources reported greater marital adjustment following the transition to parenthood than did spouses who had good initial resources but less prior experience coping with stress. The practice of using one's resources to deal with stressors might enable an individual to develop positive beliefs about their ability to cope with adversity, which in turn moderate the effect of stressful life events (Johnson, Gooding, Wood, & Tarrier, 2010). Therefore, the experience and beliefs in one's internal and external resources can be highly beneficial during the transition to parenthood.

2.2.2 Attachment style

Attachment style is another important factor which may be important in the perinatal period. Conde, Figueiredo, and Bifulco (2011) investigated the impact of attachment style on psychological adjustment in couples following the birth of their baby and found that anxious insecure (most evident in women) and avoidant insecure (most evident in men) attachment styles predicted depression and anxiety symptoms among both men and women. The reason for this may be that people with a secure attachment style seek social support in times of need and rely on constructive coping strategies to regulate affect (Mikulincer, Florian, & Weller, 1993), such as acceptance or positive reinterpretation (Carver, Scheier, & Weintraub, 1989). People with an insecure attachment style rely on less constructive ways of coping and are less able to regulate their emotions. Those with an avoidant attachment style are dependent on repressive and withdrawal strategies, whereas people with an anxious-ambivalent attachment style rely on emotion-focused coping that increases rather than decreases distress (Mikulincer, 1995; Mikulincer et al., 1993). From the point of view of the current study the emotion regulating aspect of attachment style is particularly important as its role in dealing with a challenging situation such as having a baby may have an impact on adjustment to this situation.

A recent direction in attachment research is to step away from classification of discrete attachment styles and to use broader dimensions of attachment security, avoidance and anxiety e.g. Dallos (2006) and Fraley, Waller, and Brennan (2000).

2.2.3 Mindfulness

Mindfulness has been successfully used to facilitate parents' preparation for childbirth and to reduce the risk of postnatal depression (Hughes et al., 2009; Warriner, Dymond, & Williams, 2013) and decrease mothers' symptoms of anxiety and depression perinatally (Dunn, Hanieh, Roberts, & Powrie, 2012; Vieten & Astin, 2008). Mindfulness defined as awareness stemming from purposeful and non-judgemental attention being paid to the present moment (Kabat-Zinn, 1990) can help regulate affect in a range

of stressful situations (Jimenez, Niles, & Park, 2010). Practising mindfulness can help to cope with difficult situations by enabling one to notice and acknowledge strong emotions without responding to them (Kabat-Zinn, 1990). Duncan and Bardacke (2010) also indicated that mindfulness based antenatal programmes increased positive affect and improved participants' nonreactivity to distracting and difficult sensations. On the basis of these early findings it is important to establish whether mindfulness is likely to facilitate also fathers' adjustment in the perinatal period, thus providing rationale for developing suitable interventions.

In summary, there is a gap in existing research into fathers' adjustment to the birth of their baby and a lack of understanding of protective factors associated with men's coping with arrival of their offspring. The dominating approach of identifying risk factors for men's mental health problems in the perinatal period has not led to development of a coordinated approach for prevention. Elsewhere, it has been shown that resilience, secure attachment style and mindfulness are linked with successful coping with challenging life events.

2.3 Research aims, questions and hypotheses

2.3.1 Theoretical aims

The primary aim of the project was to explore whether men's individual resources, namely secure attachment style, resilience and a mindful approach to life, are associated with lower levels of psychological symptoms in the postnatal period. Clinical aims

A secondary aim of the project was to provide the basis for further work into developing an intervention designed specifically for expectant fathers which could be used to facilitate fathers' preparation for the birth of their baby and prevent development of symptoms of postnatal anxiety and depression.

2.3.2 Research questions

Are attachment style, resilience and mindfulness associated with men's level of psychiatric symptoms shortly after the birth of their baby?

Are attachment style, resilience and mindfulness associated with men's level of psychiatric symptoms 6 weeks after the birth of their baby?

Does men's perception of labour and delivery during this specific birth moderate the relationship between attachment, resilience and mindfulness and adjustment to birth of their baby?

2.3.3 Hypotheses

1. Higher levels of attachment related anxiety and avoidance, lower resilience and mindfulness in expectant fathers before the birth of their baby will be linked with higher levels of psychiatric symptoms soon after the birth and 6 weeks after the birth of their baby.

2. Men's perception of labour and delivery during this specific birth will moderate the relationship between attachment related anxiety and avoidance, resilience, mindfulness and psychiatric symptoms at time 2 and time 3. For instance, on average, high levels of resilience, mindfulness and attachment security will promote psychological health in the post-natal period (and vice-versa), but a highly negative perception of the child's birth may override this relationship. Similarly, a highly positive perception of the birth may act as a protective factor in men who have fewer individual resources to draw upon.

2.4 Methods

2.4.1 Participants

Participants were men expecting the birth of their baby before April 2015. For inclusion men were aged over 18 years. Also to be included in the study prospective fathers were asked whether they were intending to be involved in parenting responsibilities towards the baby, however they were not required to attend the birth. The intention to be involved in

raising the child was a condition for being able to take part in the study. Further exclusion criteria were: being a father to a prematurely born baby (before 35 week of pregnancy) or a baby who needed to spend more than 12 hours at Special Care Baby Unit following birth. These participants were excluded because the additional challenges that parents of premature/ very unwell babies face could affect the data.

The recruitment strategy for the study was threefold. Initially, participants were recruited using social media (Twitter and Facebook) and email. An advert with the online link to the study was posted on the researcher's Facebook and Twitter pages as well as on pages of groups for expectant mothers and fathers. Twitter was also used to contact people who were active in parenting and perinatal fields with request to publicise the study further. Also, people who identified themselves on Twitter as expectant fathers were sent an invitation to take part in the study. In addition, the people who identified themselves as expectant mothers were sent an invitation to pass on the information about the study to their partners. Another prong of recruitment involved distribution of leaflets at local events such as Baby and Toddler Expo. The leaflets were also distributed in local nurseries and pre-schools. Finally, the study was approved by National Childbirth Trust (NCT) and all the local NCT branches (237 across England and Wales) were emailed to request help in recruitment. The branches advertised the study on their Facebook pages, in their newsletter and/or through sending the details to the members of their branch or participants of their antenatal classes.

The a priori analysis of the minimum sample size for multiple regression analyses with 3 predictors was calculated using G Power 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007) and was found to be 54 with 0.95 power, 0.35 effect size (f^2) and 0.05 probability of error. The effect size f^2=0.35 constitutes a large effect size (Cohen, 1988). The predominant effect size in the validation studies of EPDS (Matthey, 2001) was f^2=0.65 and of GHQ-28 (Banks, 1983) was f^2=0.6, which are classified as large effect sizes. However, as the current research was novel and there was no direct data on this population, the effect size of f^2= 0.35 was chosen as it is a lowest value still constituting a large effect size for the f^2 statistic (Cohen, 1988). The value of the power (0.95) was chosen to increase the impact of the

study, although in hindsight, a conventional value of 0.8 would have been sufficient. The total actual sample size was 91. This is the number of participants who completed the questionnaires before the birth of their baby. Postnatally, 49 participants completed the measures, however one participant's data had to be excluded as his baby was born before 35 weeks of pregnancy, and spent more than 12 hours on the Special Baby Care Unit. Finally, at 6 week follow-up a total of 33 participants completed the questionnaires. It is important to note that this dropout rate was mostly affected by late due dates of a proportion of participants' babies. The postnatal data for this project will continue to be gathered over the next couple of months and it is hoped that a future publication will include a higher postnatal and follow-up sample size.

2.4.2 Design

The project was a longitudinal study investigating whether expectant fathers' attachment style, resilience and mindfulness (assessed before the baby is born) predicted a range of psychological symptoms measured at two separate time points following the birth. The study also examined whether men's perceptions of their partner's delivery were linked with mental health symptoms and psychological distress.

2.4.3 Materials

The study used self-report questionnaires, which were able to be completed electronically (for certain measures their licensing guidelines prevented electronic administration). This was an important criterion to increase the likelihood of achieving a large sample size in a short time scale available for this project. The study used a number of measures, which reflect a significant number of variables assessed in this study. One of the main considerations when choosing the appropriate questionnaires was the number of items and the reliability and validity statistics. The following questionnaires were administered in the study.

1. Resilience Appraisal Scale (RAS) (Johnson et al., 2010). This is a 12-item measure of psychological resilience. Participants indicate to what extent each statement (e.g. 'I can put up with my negative emotions') applies to

them using a 5-point Likert scale ranging from 'strongly disagree') to 'strongly agree'. The possible range of scores is between 12 and 60. This scale comprises three subscales including social support, emotional regulation skills and problem solving ability (Johnson et al., 2010). Internal consistency reliability alphas were 0.88 for the overall scale, 0.93 for the social support subscale, 0.92 for the problem solving subscale and 0.92 for the emotion coping subscale (Johnson et al., 2010). In the current sample internal consistency alpha of the whole scale was 0.96.

2. The Experiences in Close Relationships-Revised (ECR-R) Questionnaire

In the attachment assessment field, the gold standard measure is Adult Attachment Interview (AAI), which is a professional administered measure and requires a specialist training to be administered and interpreted (George, Kaplan, & Main, 1985). Moreover, the AAI makes inferences about a person's attachment style from their responses to questions about their relationship with their parents during childhood (Shaver, Belsky, & Brennan, 2000). For these reasons it was decided that the AAI was not a suitable measure for this study. The alternative, self-report measures are based on questions about participant's romantic relationship. The majority of those self-report measures are based on Hazan and Shaver (1987) attachment style categories: secure, avoidant and anxious ambivalent. However, to be able to use a continuous score on a questionnaire in a statistical analysis, a measure, which used dimensions rather than distinct categories was required. This led us to select ECR-R which is a revised version of Brennan, Clark, and Shaver (1998) Experiences in Close Relationships (ECR) questionnaire consisting of 36 items. It was devised on the basis of a large-sample factor-analytic study in which all known self-report measures of attachment were included in a single analysis. Brennan et al. (1998) found twelve specific-construct factors which, when factored, formed two more global factors of Anxiety and Avoidance. The first 18 items comprise the attachment-related anxiety scale. Items 19 – 36 comprise the attachment-related avoidance scale. The participants use a 7 point Likert scale to indicate how strongly they agree with each statement, where 1 equals strongly disagree and 7 equals strongly agree.

Some items are reverse scored. Anxiety and Avoidance scales scores are calculated by averaging the participants' responses for appropriate items. The possible range of averaged scores is between 1 and 7 and the lower the score the lower the person's attachment anxiety or avoidance. Both the ECR and the ECR-R are designed to assess individual differences with respect to attachment-related anxiety (i.e., the extent to which people are insecure vs. secure about the availability and responsiveness of romantic partners) and attachment-related avoidance (i.e., the extent to which people are uncomfortable being close to others vs. secure depending on others). The questionnaire has very good test-retest reliability (Cronbach's a between .93 and .95) and very strong internal validity (Fraley et al., 2000). Internal consistency alpha in the current sample for overall scale was 0.93, for the attachment anxiety scale was 0.91 and for the attachment avoidance scale 0.90

3. Five Facet Mindfulness Questionnaire (FFMQ) (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) is a 39 item instrument based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness as it is currently conceptualized. The five facets are observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. The questionnaire is scored on a Likert scale between 1 (never or very rarely true) and 5 (very often or always true). The possible range of scores is between 39 and 195. Internal consistency of the FFMQ among non-meditators (Cronbach's alpha = 0.86) and meditators was high (Cronbach's alpha = 0.95) (Baer et al., 2008). Accumulating data suggest that the five-factor structure of the FFMQ is robust for various types of samples, and consistent evidence has underscored its construct validity (Baer et al., 2006; Baer et al., 2008), however more research needs to be completed to assess the scale's reliability. Internal consistency alpha in the current sample for the whole scale was 0.91.

4. The Perception of Labour and Delivery Scale (PLDS) (Czarnocka & Slade, 2000) comprises 24 questions about participants' perceptions of their experience of labour and delivery of a specific birth. Each item was derived from the PTSD literature. Participants were asked to rate their

perceptions on a scale of 1 to 10, regarding items considering severity of pain, amount of distress associated with the experience, satisfaction and confidence with coping, preparedness, fear for self and baby, unexpectedness of procedures and outcome, support from partner and staff, perceived control, feeling informed and listened to by staff, responsibility for difficulties experienced, and comparison of personal performance in labour with others. This questionnaire was adapted by Bradley et al. (2008) for men by focusing on perceptions of their partner's labour and delivery. Items relating to supportiveness of partner and birth plans were removed as inappropriate, leaving 23 items. Respondents are requested to rate each item on a 10-point scale ranging from (1- not at all to 10- extremely). Some items are reverse keyed. The possible range of scores is between 23 and 230, where the higher the score the more negative the perception of labour and delivery. This is not a standardised measure; however, it has been used before in a study investigating fathers' PTSD symptoms following attendance at the birth of their baby (Bradley et al., 2008). The internal consistency alpha in the current sample for the whole scale was 0.89.

5. Impact of Event Scale- Revised (IES-R) (Weiss & Marmar, 1997), evaluates the distress that is caused by traumatic events. The test is centred on three subscales – Intrusion, Avoidance and Hyperarousal. Five questions were added to the original scale (IES) (Weiss & Marmar, 1997) to better capture the DSM-IV criteria for PTSD (Sundin & Horowitz, 2002). The format for the test is a 22-item self-report in which respondents identify a stressful event and then respond to questions measuring distress with a 5-point scale between 0 (not at all) and 4 (extremely). The possible score range is between 0 and 88. Despite established cut-off points for the original IES, there are no such cut-off points for the IES-R. The author stated it is "simply inappropriate" to attempt to set universal cut-off points for scoring, as the measure is not designed to be used as a diagnostic tool (Weiss & Marmar, 1997). At the same time, certain organisations such as Improving Access to Psychological Therapies (IAPT), which use IES-R as one of recommended outcome measures suggest a clinical cut- off score of 30 and above (IAPT, 2011). The scale showed high internal consistency (alpha = 0.96) (Creamer, Bell, & Failla, 2003). In the

current sample the internal consistency alpha was 0.93 and test-re-test reliability was 0.95.

6. The General Health Questionnaire (GHQ-28) (Goldberg & Williams, 2006) is a screening device for identifying minor psychiatric disorders in the general population and within community or non-psychiatric clinical settings such as primary care or general medical out-patients. Suitable for all ages from adolescence upwards, it assesses the respondent's current state and asks if that differs from his or her usual state. It is therefore sensitive to short-term psychiatric disorders but not to long-standing attributes of the respondent. A 28 item scaled version consists of the following subscales: somatic symptoms, anxiety and insomnia, social dysfunction and severe depression (Jackson, 2007). The scale can be scored using a Likert scoring system (0-1-2-3) or a GHQ system (0-0-1-1). This study used Likert scoring as it has been shown to produce a less skewed score distribution (Goldberg & Williams, 2006). The possible range of scores using this system is between 0 and 84. Different validity studies recommend various clinical cut off scores, however most commonly used are 4 or 5 (based on GHQ scoring system). The internal consistency of GHQ is relatively high (Cronbach's alpha =0.77-0.78) and its test retest reliability has been shown to be between 0.84 and 0.93 (Goldberg & Williams, 2006). In the current sample the alpha for internal consistency was very high between 0.92 and 0.94. Test -retest reliability was 0.91.

7. Edinburgh Post Natal Depression Scale (EPDS-10) is a 10-item measure (Cox, Holden, & Sagovsky, 1987) which was originally designed to assess postnatal depression in women but has also been validated for use with men (Edmondson, Psychogiou, Vlachos, Netsi, & Ramchandani, 2010; Matthey et al., 2001). The scoring system uses a 4 point Likert scale between 0 and 3. The possible range of scores is between 0 and 30. Matthey et al. (2001) recommend an optimal clinical cut-off point for fathers as 9 or 10. 'The sensitivity and specificity of the EPDS-10 is reported at 0.86 and specificity at 0.78 (Cox et al., 1987). It has been used before to assess men's psychological health following the birth of their baby (Bradley & Slade, 2010). In the current sample of men the internal consistency alpha was 0.83 and the test-retest reliability alpha was 0.89.

2.4.4 Procedure for administration of the measures

The above measures were completed by participants at three different points. At time 1, which was before the baby's due date, participants completed a survey including the demographics, a question about expectations of involvement in parenting responsibilities as well as previous psychological problems and treatment. The demographics measured were age (assessed by a request to state age), ethnicity (a single choice question from a range of options provided), previous experience of being a father ("Apart from the baby who is due soon, do you have any other children?") and the number of children the participant already has. Previous psychological problems were assessed as a single yes/no question ("Have you ever suffered with any mental health problems?"). If a participant responded yes, they were asked a further question to provide more details ("Please provide more details about the kind of mental health problem you experienced and treatment received"). At this point the following measures were also administered: Resilience Appraisal Scale (RAS), The Experiences in Close Relationships-Revised (ECR-R) Questionnaire, Five Facet Mindfulness Questionnaire (FFMQ) and The General Health Questionnaire (GHQ-28). Unfortunately, the range of time at which the first set of measures was completed varied greatly as some participants completed the questionnaires very early on in their partner's pregnancy (around 12 weeks), others in the middle of the pregnancy, whereas some completed them just before the birth (around 38-40 weeks). This issue is considered further in the discussion section. At time 2, which was approximately 2 weeks after the baby's due date, the participants were emailed a link to the following measures: The Perception of Labour and Delivery Scale (PLDS), Impact of Event Scale- Revised (IES-R), Edinburgh Post Natal Depression Scale (EPDS-10) and GHQ-28. Finally, at time 3 (6 weeks after time 2) the participants received a link with the IES-R, GHQ-28 and EPDS-10.

2.4.5 Ethics

The study was reviewed and approved the School of Psychology Ethics Committee and the University of Southampton Research Governance Office. Through this process it was established that no further ethics

clearance from the NHS was required. An approval was also sought from the NCT, who supported the participants' recruitment process. A participant information sheet and informed consent form (in Appendix B and C) explained the nature of the study and the right to withdraw at any time without affecting anonymity. Contact details of the researcher were available on the information and debrief sheets. The online questionnaire required a box to be clicked indicating informed consent. A debrief statement at the end of the study gave information of the reason for the study and advice on how to access support, if the participants suffered any distress following completion. No deception was used.

2.5 Analyses

Data analysis was completed using Statistical Packages for Social Sciences Version 22 (SPSS v.22). Missing data was found to be very minor (<1%) and mean substitution was used to calculate those figures and maintain the sample size. Preliminary analysis of the data was completed to prepare data for analysis, produce descriptive statistics and identify outliers. Distribution of the data was assessed using plots of skewness and kurtosis and Kolmogorov-Smirnov tests. Tests of normality were conducted to assess distribution within the data. A correlation matrix was created to identify which predictors were significantly correlated with which outcome variables. Multiple regression was completed to develop a model of relationships between psychological symptoms before the birth of the baby (time 1) and predictor variables. A one way ANOVA was completed for psychological symptoms at times 1 (before the birth), 2 (after birth of the baby) and 3 (6 weeks follow up) to assess any change in this variable from before to after the birth of the baby. Moderation analysis was conducted for time 2 data to assess the effect of perception of labour and delivery on the relationship between predictor and outcome variables. This was conducted using PROCESS macro for SPSS.

2.6 Results

2.6.1 Analysis of data collected prenatally

The sample size at the first point of data collection (before the birth of the baby) was N=91. The participating fathers varied in age between 22 and 50 years old, with a mean age of 33 years. 70 % of participants were first time fathers, 30% had already had between 1 and 5 children (M=1.4, SD=0.97). 86.8% of participants did not identify themselves as suffering from any mental health problems in the past. There were no specific hypotheses made about the relationship between resilience, attachment and mindfulness and men's psychological symptoms prenatally, however it was deemed important to analyse post hoc.

Descriptive statistics for the predictor variables are provided below.

Table 5 : Descriptive statistics for predictor variables.

	Resilience (RAS)	*Attachment related anxiety (ECR-R)*	*Attachment related avoidance (ECR-R)*	*Mindfulness (FFMS)*	*Perceptions of labour and delivery (PLDS)*
Mean	51.97	2.194	2.223	132.68	116.19
SD	8.147	0.959	0.852	15.72	25.936
Min	12	1	1	95	69
Max	60	4.83	4.44	179	203
Possible range	12-60	1-7	1-7	39-195	23-230

Data were examined for outliers and the ones identified were winsorised (Field, 2009). Frequency plots, skewness and kurtosis statistics and values of Kolmogorov-Smirnov test were analysed to check for normality of distribution in the outcome variable- a measure of psychological symptoms at time 1. Transformation using a square root method was required to improve the normality of distribution of the outcome variable which succeeded.

2.6.1.1 Testing of assumptions for multiple regression

There was independence of residuals, as assessed by a Durbin-Watson statistic of 2.103. Assumption of linear relationships between dependent and independent variables was tested by examining a scatterplot between the studentized residuals against the (unstandardized) predicted values, and by checking partial regression plots, which all showed linearity. The scatterplot between the studentized residuals against the predicted values was also used to check for homoscedasticity. There was no multicollinearity within the data as all the correlations between the variables were below 0.7 and the tolerance values of collinearity statistics were all well above 0.1 (the lowest being 0.605). There were no significant points of leverage (only 1 case had Leverage value of slightly above 0.2, however the decision was made not to exclude it at this point) or highly influential cases. Finally, normal p-p plot of standardised regression residual was scrutinised for normality and it was concluded that the assumption of normality was not violated.

2.6.1.2 Testing multiple regression model

Before the multiple regression model was created, the correlation values (Pearson r and point-biserial correlation for "having other children" variable which was binary) between collected predictor variables and the outcome variable were analysed to check which were suitable to be included in the model (see Table 6). All hypothesised variables were significantly correlated with the outcome variable.

Table 6 : Summary of correlations between variables measured at time 1

Predictor variables	*Psychological symptoms at time 1*
Mindfulness	-.463**
Resilience	-.399**
Attachment related anxiety	.393**
Attachment related avoidance	.331**
Previous mental health problems	.307**
Age	.123
Having other children	-.038

Note: *p<.05, **p<.001

A multiple regression model was created using the Enter method to test whether resilience, attachment related anxiety and avoidance and mindfulness predicted men's scores on GHQ-28 at time 1. In addition to that an experience of mental health problems in the past (categorical variable) was inputted into the model. The overall model was significant, $F(5, 84) = 8.867$, $p < .0005$. Previous mental health problems, mindfulness, resilience and attachment based anxiety and avoidance statistically significantly predicted psychological symptoms at time 1. Proportion of variance in psychological symptoms at time 1 that can be accounted for by the independent variables was 30.9% (adj. R^2=.309) as estimated in population. This is indicative of a medium effect size, according to Cohen (1988) classification. The contribution of attachment related avoidance and mindfulness to the model was statistically significant over and above the contribution of previous mental health problems, $p < .05$. It should be noted that Bonferroni correction of the alpha level was not performed as all the statistical tests were hypothesis driven. Previous mental health problems, attachment avoidance and mindfulness were all statistically significant individual predictors. Regression coefficients and standard errors can be found in Table 7 (below).

Table 7 : Summary of multiple regression analysis for psychological symptoms at time 1

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	6.789	1.445		4.699	.000
Previous mental health problems	.807	.322	.239*	2.506	.014
Resilience	-.017	.022	-.083	-.763	.448
Attachment related anxiety	.087	.133	.075	.658	.512
Attachment related avoidance	.295	.146	.219*	2.021	.046
Mindfulness	-.022	.008	-.302*	-2.883	.005

Note: *p<.05, B= unstandardised regression coefficient, Std. Error= standard error of the coefficient, Beta= standardised coefficient

2.6.2 Analysis of the data collected postnatally

This part of the analysis was conducted to answer the question whether resilience, mindfulness and attachment were associated with the level of psychiatric symptoms in fathers shortly after the birth of their baby.

There was a dropout rate of 46% between time 1 and time 2. There was a concern that the men who dropped out were more likely to have higher levels of psychological symptoms than those who stayed in the study, however there was an indication that it may not be the case as there was no statistically significant difference in mean score on GHQ-28 between men who dropped out (M=17.023) and those who continued in the study (M=16.958). Six participants (12.24%) scored above the recommended clinical cut off point for fathers (10) on EPDS-R at time 2, although only 1 scored above 12, which is a clinical cut off point typically used for mothers. All participants scored below recommended clinical cut-off point (30) on the IES-R at time 2. A vast majority of participants, 91.3%, was present at the birth of their baby. Descriptive statistics for the perceptions of labour and delivery variable are presented below.

Table 8 : Descriptive statistics for perceptions of labour and delivery

Statistic	*Perceptions of labour and delivery (PLDS)*
Mean	116.19
SD	25.936
Min	69
Max	203
Possible range	23-230

2.6.2.1 Analysis of change over time in men's adjustment

To check whether men's adjustment changed over time each dependent variable's means for different time points were compared. As psychological symptoms (measured by GHQ-28) were assessed at 3 different time points a repeated measures ANOVA was conducted. Of all the assumptions tested, only the assumption of normality for time 2 and time 3 was violated, however the decision was made to proceed as a one way repeated measures ANOVA is robust to deviations of normality (Howell, 2012). More importantly, the Mauchly's test of sphericity indicated that the assumption of sphericity had not been violated, $\chi 2(2) = 1.007$, $p = .604$.

There was no statistically significant difference between men's level of psychological symptoms at times 1, 2 and 3: $F(2, 64) = 1.081$, $p = 0.345$. As postnatal depression (Edinburgh Postnatal Depression Sale) and traumatic symptoms (Revised Impact of Event Scale) were measured only at times 2 and 3, their means were compared using paired samples t-test. There was no statistically significant difference between time 2 and time 3 measures of traumatic symptoms ($t(32)=0.182$, $p=.853$) or postnatal depression ($t(32)=-.910$, $p=.370$). See table below for specific means and standard deviations.

Table 9 : Means and standard deviations of outcome variables

Variable	*Mean*	*Standard deviation*	*Min*	*Max*	*Possible range*
Psychological symptoms at time 1	16.12	8.674	3	59	0-84
Psychological symptoms at time 2	14.73	9.596	0	60	0-84
Psychological symptoms at time 3	16.94	8.231	1	41	0-84
Postnatal depression at time 2	3.52	3.374	0	21	0-30
Postnatal depression at time 3	3.91	3.329	0	12	0-30
Traumatic symptoms at time 2	7.21	6.604	0	23	0-84
Traumatic symptoms at time 3	6.94	8.231	0	25	0-84

2.6.2.2 Multiple regression model for the postnatal data

Total sample size at time 2 was 48. To determine which variables should be included in the regression models a correlation table was created to identify which predictor variables were significantly correlated with outcome variables.

Table 10 : Summary of correlations for time 2 outcome variables

Predictor variables	*Psychological symptoms at time 2*	*Postnatal depression at time 2*	*Traumatic symptoms at time 2*
Mindfulness	-.210	-.236	-.056
Resilience	-.232	-408**	-.080
Attachment related anxiety	.243	.326*	.264
Attachment related avoidance	.143	.086	.253
Previous mental health problems	.465**	.528**	.120
Psychological symptoms at time 1	.547**	.472**	.348*
Perceptions of labour and delivery	.329*	.239	.413**
Age	-.244	.009	.088
Having other children	.020	.304	-.170

Note: *p<.05, **p<.01

2.6.2.2.1 Predictors of postnatal depression

As with the previous multiple regression model, the same procedures were followed to test the assumptions. There was independence of residuals, as assessed by a Durbin-Watson statistic of 2.438. There was a linearity of relationship between dependent and independent variables and there was no homoscedasticity. There was no collinearity as tested by collinearity statistics and partial correlations. Four cases were excluded from further analysis as their Leverage value was above 0.2 (between 0.249-0.385). The remaining data was distributed approximately normally.

The overall model was significant $F(4, 41) = 5.366$, $p < .001$. Previous mental health problems, psychological symptoms at time 1, resilience and attachment based anxiety statistically significantly predicted postnatal depression at time 2. The proportion of the variance in postnatal depression at time 2 that can be accounted for by the independent

variables was 28% (adj. R^2=.28) as estimated in population. This is indicative of a small to medium effect size, according to Cohen (1988) classification. The existence of previous mental health problems was the only significant individual predictor ($p < .05$). Regression coefficients and standard errors can be found in Table 11 (below).

Table 11 : Summary of multiple regression analysis for postnatal depression at time 2

Variable	*B*	*Std. Error*	*Beta*	*t*	*Sig.*
(Constant)	9.908	11.297		.877	.386
Previous mental health problems	4.475	1.554	.393*	3.054	.004
Psychological symptoms at time	.785	1.315	.227	1.561	.126
Resilience	-1.604	.133	-.187	-1.220	.229
Attachment related anxiety	1.428	1.920	.123	.744	.461

Note: *p<.005, B= unstandardised regression coefficient, Std. Error= standard error of the coefficient, Beta= standardised coefficient

2.6.2.2.2 Predictors and moderators for postnatal psychological symptoms

Before the moderation analysis was run for psychological symptoms at time 2 and traumatic symptoms at time 2, the data for both those outcome variables were tested for the same assumptions as for linear regression using the process in the step above. All the assumptions were met.

The moderation analysis was conducted using the PROCESS macro for SPSS (Hayes, 2013). As only previous mental health problems, prenatal psychological symptoms and perception of labour and delivery were significantly correlated with postnatal psychological symptoms (see Table 7), only those variables were included in the moderation analysis.

The relationship between psychological symptoms at time 2 and psychological symptoms at time 1 was not statistically significantly moderated by men's perception of labour and delivery (controlling for

previous mental health problems) as *b*=0.208, SE=.0365, 95% CI [-.0529-.0944], t=.5699, p=.27.

A posthoc analysis of multiple linear regression was conducted to determine whether perception of labour and delivery, prenatal psychological symptoms and previous mental health problems were significant predictors of postnatal psychological symptoms. The overall model was significant: F(3, 42) = 9.297, p < .001. Those three variables together significantly predicted postnatal psychological symptoms. The proportion of variance in postnatal psychological symptoms that can be accounted for by the independent variables was 35.6% (adj. R^2=.356) as estimated in the population. This is indicative of a medium effect size, according to Cohen (1988) classification. The perception of labour and delivery statistically significantly contributed to the model over and above the effect of previous mental health problems and psychological symptoms at time 1, p< .05. The statistically significant individual predictors were previous mental health problems, psychological symptoms at time 1 and perceptions of labour and delivery. Regression coefficients and standard errors can be found in Table 12 (below).

Table 12 : Summary of multiple regression analysis for psychological symptoms at time 2

Variable	*B*	*Std. Error*	*Beta*	*t*	*Sig*
(Constant)	-10.750	5.992		-1.794	.080
Previous mental health problems	10.453	4.311	.292*	2.425	.020
Psychological symptoms at time 1	4.695	1.231	.459**	3.814	.000
Perceptions of labour and delivery	.071	.030	.280*	2.332	.025

Note: *p<.05, **p<.001 B= unstandardised regression coefficient, Std. Error= standard error of the coefficient, Beta= standardised coefficient

2.6.2.2.3 Predictors and moderator for postnatal traumatic symptoms

The moderation analysis was again conducted using the PROCESS macro for SPSS (Hayes, 2013). As only psychological symptoms at time 1 and perceptions of labour and delivery were statistically correlated with postnatal traumatic symptoms (see Table 7) only those variables were included in the model. The relationship between traumatic symptoms at time 2 and psychological symptoms at time 1 was not statistically significantly moderated by men's perception of labour and delivery as *b*=-.0056, SE=.0305, 95% CI [-.0672-.0559], t=-.1852, p=.854.

Again, a post hoc multiple regression analysis was undertaken to establish whether perception of labour and delivery and prenatal psychological symptoms were significant predictors of postnatal traumatic symptoms. The overall model was significant: F(2, 43) = 9.601, p< .001. It was found that both predictor variables together significantly predicted postnatal psychological symptoms. Proportion of variance in postnatal psychological symptoms that can be accounted for by the independent variables was 27.7% (adj. R^2=.277) as estimated in population. This is indicative of a small to medium effect size, according to Cohen (1988) classification. The perception of labour and delivery statistically significantly contributed to the model over and above the effect of psychological symptoms at time 1, and both variables were statistically significant individual predictors p< .05. Regression coefficients and standard errors can be found in Table 13 (below).

Table 13 : Summary of multiple regression analysis for traumatic symptoms at time 2

Variable	*B*	*Std. Error*	*Beta*	*t*	*Sig.*
(Constant)	-9.162	3.881		-2.361	.023
Psychological symptoms at time 1	1.949	.794	.311*	2.454	.018
Perceptions of labour and delivery	.073	.020	.473**	3.727	.001

Note: *p<.05, **p<.005 B= unstandardised regression coefficient, Std. Error= standard error of the coefficient, Beta= standardised coefficient

2.6.3 Analysis of the follow up data

This part of the analysis was conducted to answer the question whether resilience, mindfulness and attachment were associated with the level of psychiatric symptoms in fathers at 6 week follow up.

Total sample size at time 3 was 33. Four participants (12.12%) scored above a recommended clinical cut off point for fathers (10) for postnatal depression. No participants scored above 30 (suggested clinical cut off point indicating possible PTSD) on IES-R.

Firstly, a correlation table was created to establish which predictor variables were significantly correlated with the outcome variables (see Table 14).

Table 14 : Summary of correlations for time 3 outcome variables

Predictor variables	*Postnatal depression at time 3*	*Traumatic symptoms at time 3*	*Psychological symptoms at time 3*
Mindfulness	-.251	-.416*	-.214
Resilience	-.547**	-.402*	-.427*
Attachment related anxiety	.478**	.292	.376*
Attachment related avoidance	.435*	.192	.317
Previous mental health problems	.137	-.076	.155
Psychological symptoms at time 1	.605**	.487**	.685**
Perceptions of labour and delivery	-.121	.080	-.118
Age	-0.94	-.066	-.153
Having other children	.079	-.223	.160

Note: *p<.05, **p<.01

2.6.3.1 Multiple regression model for postnatal depression at follow up

Again, as in previous regression analysis, first the appropriate assumptions were checked. Three cases were excluded from further analysis due to risky Leverage values (above 0.2). Other assumptions were met. The analysis of multiple linear regression was conducted to determine whether resilience, attachment anxiety and avoidance as well as prenatal psychological symptoms were significant predictors of postnatal depression at follow up. The overall model was significant: $F(4, 25) = 12.159$, $p < .001$. It was found that those variables together significantly predicted postnatal psychological symptoms. The proportion of variance in postnatal depression at follow up that can be accounted for by the independent variables was 60.6% (adj. R^2=.606) as estimated in population. This is indicative of a large effect size, according to Cohen (1988) classification. Resilience was the only variable which statistically significantly contributed to the model over and above the effect of psychological symptoms at time 1, and these were the only two variables which were statistically significant individual predictors, $p< .05$. Regression coefficients and standard errors can be found in Table 15 (below).

Table 15 : Summary of multiple regression analysis for postnatal depression at time 3

Variable	*B*	*Std. Error*	*Beta*	*t*	*Sig.*
(Constant)	23.176	12.142		1.909	.068
Psychological symptoms at time 1	2.049	.425	.659**	4.822	.000
Resilience	-3.350	1.492	-.379*	-2.245	.034
Attachment related anxiety	-3.428	1.791	-.316	-1.914	.067
Attachment related avoidance	.972	.686	.261	1.416	.169

Note: *p<.05, **p<.001 B= unstandardised regression coefficient, Std. Error= standard error of the coefficient, Beta= standardised coefficient

2.6.3.2 Multiple regression model for traumatic symptoms at follow up

According to previously described guidelines the appropriate assumptions for multiple linear regression were checked first and it was found that all were met. The analysis of multiple linear regression was conducted to determine whether resilience, mindfulness and prenatal psychological symptoms were significant predictors of traumatic symptoms at follow up. The overall model was significant $F(3, 26) = 4.794$, $p < .01$. It was found that those variables together significantly predicted traumatic symptoms at follow up. Proportion of variance in postnatal depression at follow up that can be accounted for by the independent variables was 28.2% (adj. R^2=.282) as estimated in population. This is indicative of a small to medium effect size, according to Cohen (1988) classification. Prenatal psychological symptoms was the only individual variable which statistically significantly contributed to the model, $p< .05$. Regression coefficients and standard errors can be found in Table 16 (below).

Table 16 : Summary of multiple regression analysis for traumatic symptoms at time 3

Variable	*B*	*Std. Error*	*Beta*	*t*	*Sig.*
(Constant)	39.196	27.923		1.404	.172
Psychological symptoms at time 1	3.487	1.284	.439*	2.715	.012
Resilience	-4.412	3.728	-.195	-1.226	.231
Mindfulness	-.101	.082	-.204	-1.184	.247

Note: *p<.05, B= unstandardised regression coefficient, Std. Error= standard error of the coefficient, Beta= standardised coefficient

2.6.4 Multiple regression model for psychological symptoms at follow up.

Finally, as previously the appropriate assumptions for multiple linear regression were checked first and it was found that all were met. The

analysis of multiple linear regression was conducted to determine whether resilience, attachment related anxiety and prenatal psychological symptoms were significant predictors of psychological symptoms at follow up. The overall model was significant: $F(3, 26) = 11.979$, $p < .001$. It was found that those variables together significantly predicted psychological symptoms at follow up. Proportion of variance in postnatal depression at follow up that can be accounted for by the independent variables was 53.2% (adj. R^2=.532) as estimated in population. This is indicative of a medium to large effect size, according to Cohen (1988) classification. Resilience was the only individual variable which statistically significantly contributed to the model over and above the contribution of prenatal psychological symptoms, and these were the only two variables which were statistically significant individual predictors p< .05. Regression coefficients and standard errors can be found in Table 17 (below).

Table 17 : Summary of multiple regression analysis for psychological symptoms at time 3

Variable	*B*	*Std. Error*	*Beta*	*t*	*Sig.*
(Constant)	67.211	30.642		2.193	.037
Psychological symptoms at time 1	6.446	1.222	.764**	5.273	.000
Resilience	-8.859	3.677	-.369*	-2.409	.023
Attachment related anxiety	-7.828	5.032	-.266	-1.556	.132

Note: *p<.05, **p<.001 B= unstandardised regression coefficient, Std. Error= standard error of the coefficient, Beta= standardised coefficient

2.7 Discussion

This study aimed to investigate the relationship between expectant fathers' resilience, attachment style and mindfulness and the level of postnatal depression and other psychological symptoms in the perinatal

period. It was hoped that the data would provide insight into the protective factors linked with lower levels of mental health problems in fathers. It was also envisaged that the findings would contribute towards development of a preventative intervention promoting positive mental health of expectant and new fathers.

2.7.1 Key findings

Partly in line with the hypotheses, we found that high levels of resilience, low attachment anxiety and avoidance as well as high levels of mindfulness were together significantly related to lower levels of psychiatric symptoms, however only prenatally. When controlling for previous mental health problems, only mindfulness and attachment related avoidance significantly contributed to the variance in prenatal psychological symptoms. Mindfulness had the strongest negative relationship with prenatal psychological symptoms, pointing towards its potential relationship with better psychological functioning of fathers in the antenatal period.

There were no statistically significant differences in the level of psychological symptoms from before the birth of the baby, to after the arrival of the baby to 6 weeks follow up. There was also no significant improvement in postnatal depression over the course of 6 weeks of follow up. The rate of postnatal depression found in this sample was around 12% soon after birth and at follow up. It is important to note though, that this rate was based on a clinical cut of score recommended for fathers (9 or 10) (Matthey et al., 2001; Morse, Buist, & Durkin, 2000) rather than the score of 12, more often used for mothers (Bradley & Slade, 2011). The rate of 12% is similar to the rates reported elsewhere (Paulson & Bazemore, 2010). The rates of traumatic symptoms in this sample were below the clinical levels soon after birth and at follow up (Bradley et al., 2008). The lack of significant change in mental health symptoms between the prenatal and postnatal periods is consistent with some existing literature (Areias, Kumar, Barros, & Figueiredo, 1996a). Other studies suggest there is a small improvement in men's psychopathology postpartum with insignificant further changes over this course of the first postnatal year (Condon, Boyce, & Corkindale, 2004; Matthey, Barnett, Ungerer, & Waters,

2000; Morse et al., 2000). This is an important finding as it suggests that if a father experiences psychological symptoms antenatally it is likely that the symptoms will persist after the birth of the baby.

Previous studies suggested that young fathers (28 years old and younger) have been shown to be at a higher risk of postnatal depression than older fathers, indicating the importance of providing targeted support for this group of men (Bergström, 2013; Garfield et al., 2014). However, the current study did not support this as age was not related to any of the outcome variables.

Resilience, attachment related anxiety and avoidance as well as mindfulness appeared to be less related with men's psychiatric symptoms soon after the birth of the baby. For instance, postnatal depression levels following the birth were significantly correlated with resilience and attachment based anxiety; however, when controlling for previous mental health problems, their individual contribution to the model was no longer significant. This indicates that a history of mental health problems was the strongest predictor of postnatal depression soon after the birth of the baby. Previous studies have identified a history of psychopathology as a risk factor for postnatal depression in both mothers and fathers (Areias, Kumar, Barros, & Figueiredo, 1996b; Lancaster et al., 2010; Ramchandani, Stein, et al., 2008). Psychological and traumatic symptoms shortly after birth were not related to any of the hypothesised variables. A post hoc analysis revealed that significant predictors for those variables were men's perceptions of labour and delivery, even after controlling for previous mental health problems and antenatal psychological symptoms. This is in line with some studies suggesting that experiencing labour as a positive experience is linked with lower levels of postnatal depression (Greenhalgh et al., 2000). However, contrary to the hypothesis, the perceptions of labour and delivery were not a moderating factor.

Interestingly, the analysis of the follow up data revealed that approximately 6-10 weeks after the birth, the perceptions of labour and delivery were not significantly correlated with any of the outcome variables. This may be related to a potential power problem due to a drop in sample size. However, it may also suggest that soon after the birth,

men's experience in the delivery room is likely to be more relevant to them and affect their psychological functioning. However, 6 weeks later, for the majority of fathers other factors appear to impact their mental health in more significant ways. For instance, resilience was the only hypothesised factor which significantly contributed to the variance in postnatal depression and psychological symptoms at follow up, independently from prenatal psychological symptoms. This is likely, considering that resilience (as measures by the RAS) focuses on the ability to use one's social support and problem solving skills. It also has been shown that one's perception of the available social support in the postnatal period is related to the level of psychopathology in both mothers and fathers (Gao, Chan, & Mao, 2009; Leathers, Kelley, & Richman, 1997; Wee, Skouteris, Pier, Richardson, & Milgrom, 2011).

Mindfulness was a contributing factor in the statistically significant model predicting traumatic symptoms at follow up (alongside prenatal psychological symptoms and resilience); however, its individual input was not statistically significant. Attachment anxiety and avoidance also had a role in the statistically significant model predicting variation in postnatal depression and psychological symptoms (anxiety only) at follow up; however, again, their individual contribution was not statistically significant.

Interestingly, the effect sizes of regression models for the follow up data were much larger, especially for postnatal depression (60.6% of variance accounted for by the model) and psychological symptoms (53.2% of variance accounted for by the model) than of the models analysed for pre or postnatal data, which accounted for around 30% of variance in those variables. One factor, which featured consistently in those models was antenatal psychological symptoms. This suggests that fathers' adjustment to birth and postnatal wellbeing is most strongly linked with their psychological functioning during pregnancy. This finding contributes to the existing research identifying the strong positive relationship between paternal mood pre- and postnatally (Matthey et al., 2000). Moreover, this emphasises the importance of routine mood assessment of men whose partners are pregnant and availability of interventions for those who suffer with depressive and anxiety symptoms antenatally.

2.7.2 Study strengths and limitations

One of the biggest strengths of the study is its longitudinal design, which enabled the measurement of paternal psychological functioning at three separate points in time. However, it is important to note that the follow up was conducted relatively early, 6 weeks after the first postnatal measurement and potentially more significant changes could have been observed if the follow up period was longer. A further strength was inclusion of questions about history of any psychopathology and measurement of psychological symptoms prenatally, which enabled analysis of those crucial variables.

One of the study limitations was that the data from 46% of the participants were not available at Time 2 due to the fact that their babies were not yet born before the time of data analysis. However, there was no indication of a difference in reported psychopathology prenatally between those whose data was and was not available at Time 2. As a result the study sample sizes at times 2 and 3 were lower than the one identified in power calculations (54), and much lower than some population studies. Moreover, due to the fact that there were substantial differences in the numbers of participants at each time point (91, 48 and 33) it is not possible to state whether the different relationships between the respective variables at each time point reflect true difference in the relative importance of the variables during the antenatal or postnatal period, or relate to the changes in participant numbers or characteristics, changes in the ranges of key variables or changes in statistical power. The very low sample size at time 3, especially in the context of performing multiple regression analysis is a further limitation of the study, as one of the recommendations about sample size for regression suggests using between 10-15 cases per predictor (Field, 2009).

Another limitation of the study was the character of the questionnaire chosen to measure attachment style. It is possible that because of the way in which certain items in the Experience in Close Relationships- Revised scale are phrased they may be perceived as referring to a participant's experience in their current relationship, rather than how they usually are in relationships in general. As such, an alternative measure of attachment

could be considered in the future research, such as State Adult Attachment Measure (SAAM) (Gillath, Hart, Noftle, & Stockdale, 2009).

A further limitation of the study was linked to the administration of questionnaires antenatally. Due to the fact that the link with the first set of measures was used for recruitment to the study, the time during the pregnancy when participants completed the questionnaires was not controlled for. Consequently some participants completed the first set of measures very early in pregnancy and others at much later stages. In future research it may be worth to consider the use of a link with only sociodemographic questions and emailing the first set of measures at a pre-determined point in pregnancy. However, this solution was not used over concern it could have negative impact on sample size and drop-out rate. The study used continuous scores on all the measures for analysis as the vast majority of participants scored below the clinical cut off points on measures of depression and traumatic symptoms. However, as the research questions regarded symptom severity rather than a disorder per se and there was sub-clinical variation in scores on measures of psychiatric symptoms, it was not deemed problematic. It is also likely, that the sample was self-selecting due to the method of data collection which included the use of the social media, NCT, where antenatal classes are paid for by participants etc. Therefore, it may not have been possible to reach a less privileged population as well as those who may have experienced higher levels of psychopathology. As a result of these limitations the results of the study may not generalise to the wider population.

2.7.3 Clinical and research implications

The study has some potential implications for clinical practice. Firstly, it emphasises the importance of screening men for anxiety and depression during their partner's pregnancies, as it is likely that if a father is experiencing psychological symptoms antenatally, they will continue postnatally too. The rate of postnatal depression in fathers in the current project was 12 %. Estimated rates of depression in men during perinatal period from other studies vary significantly (between 1.2% to 25.5%) (Goodman, 2004), therefore it would be beneficial to introduce a routine

screening for men in the same way as it is conducted for pregnant women. It is also crucial that the data from this antenatal screening is systematically analysed to provide further evidence of prevalence rates of depression in men during pregnancy and estimate a scale of a need for intervention.

The second important implication regards the content of potential intervention for expectant fathers. This study provides an indication that the inclusion of material that develops mindfulness and promotes resilience, especially the ability to use the available social support, may be beneficial for expectant fathers. Current research into mindfulness based antenatal classes is promising (Dunn et al., 2012; Hughes et al., 2009; Vieten & Astin, 2008; Warriner et al., 2013), however it is important that a programme is developed specifically for fathers incorporating resilience and mindfulness skills. Other research has already emphasised the benefits of adjusting antenatal preparation classes for fathers (Deave & Johnson, 2008; Wente & Crockenberg, 1976) and especially classes run specifically for fathers by fathers (Friedewald, Fletcher, & Fairbairn, 2005). Most importantly, it is recommended that any intervention should be offered to all men rather than providing support groups for depressed fathers or men whose partners are depressed. This stems from the literature suggesting that routinely drawing fathers into perinatal education and care, while assessing and responding to their needs where indicated, is more acceptable and beneficial to men (Burgess, 2011; May & Fletcher, 2013). Moreover, fathers who have insufficient information about pregnancy and childbirth are also at risk of being distressed, suggesting that more attention needs to be paid to providing information to men about pregnancy, childbirth and caring for an infant (Boyce, Condon, Barton, & Corkindale, 2007).

This study emphasised the importance of men's perceptions of labour and delivery and their relationship with their psychological wellbeing postnatally, which is in line with some early preliminary studies (Bradley et al., 2008). It is therefore crucial that the role and needs of men present in the delivery room are actively considered and responded to by professionals, such as midwives and doctors (de Montigny & Lacharité, 2004).

The variables explored in this study accounted for only around 30-60% of variance in levels of psychiatric symptoms measured here. It is therefore important that future research considers other factors which can contribute to perinatal mental health in fathers, such as quality of a relationship with a partner (Kvalevaag et al., 2013) or maternal mental health (Zelkowitz & Milet, 2001). What would also be beneficial is a larger scale prospective study to identify key risk and protective factors. It would also be beneficial for both mothers and fathers to be included in a study examining perceptions of relationship quality as a predictor of better perinatal mental health.

2.7.4 Conclusions

Men's psychological wellbeing in the perinatal period is a subject of growing interest among researchers. As there is growing evidence for a strong positive relationship between postnatal paternal mental health problems and children's outcomes it is crucial that fathers are appropriately supported during this potentially challenging time. This longitudinal study provided early evidence for the positive relationship between resilience, mindfulness and fathers' mental wellbeing in the perinatal period, as well as a negative relationship between attachment based anxiety and avoidance and psychological symptoms in fathers during pregnancy and beyond. It was found that paternal wellbeing during pregnancy is one of the strongest indicators of their functioning postpartum, which strengthens the rationale for antenatal screening and interventions for fathers. The study also indicates that interventions promoting mindfulness and resilience in fathers may be beneficial, however, further research is needed to establish their efficacy.

Appendix A - Details of selected papers

Authors (Year)	Title	Parent tested	Design
Carro, M. G., Grant, K. E., Gotlib, I. H., & Compas, B. E. (1993)	Postpartum depression and child development: An investigation of mothers and fathers as sources of risk and resilience	Mothers and fathers	L
Davé, S., Nazareth, I., Sherr, L., & Senior, R. (2005)	The association of paternal mood and infant temperament: A pilot study.	Fathers	L
Fletcher, R. J., Feeman, E., Garfield, C., & Vimpani, G. (2011)	The effects of early paternal depression on children's development	Fathers	L
Giallo, R., Cooklin, A., Wade, C., D'Esposito, F., & Nicholson, J. M. (2013)	Psychosocial risk factors associated with fathers' mental health in the postnatal period: results from a population-based study.	Fathers	L
Gutierrez-Galve, L., Stein, A., Hanington, L., Heron, J., & Ramchandani, P. (2015)	Paternal Depression in the Postnatal Period and Child Development: Mediators and Moderators.	Mothers and fathers	L
Hanington, L., Heron, J., Stein, A., & Ramchandani, P. (2012).	Parental depression and child outcomes - is marital conflict the missing link?	Mothers and fathers	L
Hanington, L., Ramchandani, P., & Stein, A. (2010)	Parental depression and child temperament: Assessing child to parent effects in a longitudinal population study	Mothers and fathers	L
Kvalevaag, A. L., Ramchandani, P. G., Hove, O., Assmus, J., Eberhard-Gran, M., & Biringer, E. (2013)	Paternal Mental Health and Socioemotional and Behavioral Development in Their Children.	Mothers and fathers	L
Kvalevaag, A. L., Ramchandani, P. G., Hove, O., Eberhard-Gran, M., Assmus, J., Haavik, O. E., Biringer, E. (2014)	Does paternal mental health in pregnancy predict physically aggressive behavior in children?	Mothers and fathers	L

Appendix A

Luoma, I., Puura, K., Mäntymaa, M., Latva, R., Salmelin, R., & Tamminen, T. (2013)	Fathers' postnatal depressive and anxiety symptoms: An exploration of links with paternal, maternal, infant and family factors.	Mothers and fathers	C-S
Paulson, J. F., Keefe, H. A., & Leiferman, J. A. (2009)	Prenatal and postpartum depression in fathers and its association with maternal depression: a meta-analysis.	Mothers and fathers	L
Ramchandani, P., Stein, A., Evans, J., & O'Connor, T. G. (2005)	Paternal depression in the postnatal period and child development: a prospective population study.	Mothers and fathers	L
Ramchandani, P. G., O'Connor, T. G., Evans, J., Heron, J., Murray, L., & Stein, A. (2008)	The effects of pre- and postnatal depression in fathers: A natural experiment comparing the effects of exposure to depression on offspring.	Fathers	L
Ramchandani, P. G., Stein, A., O'Connor, T. G., Heron, J., Murray, L., & Evans, J. (2008)	Depression in men in the postnatal period and later child psychopathology: A population cohort study.	Mothers and fathers	L
Ramchandani, P. G., Psychogiou, L., Vlachos, H., Iles, J., Sethna, V., Netsi, E., & Lodder, A. (2011).	Paternal depression: an examination of its links with father, child and family functioning in the postnatal period.	Mothers and fathers	C-S
Smith, H. R., Eryigit Madzwamuse, S., & Barnes, J. (2013)	Paternal postnatal and subsequent mental health symptoms and child socio-emotional and behavioural problems at school entry.	Mothers and fathers	L
Van Batenburg-Eddes, T., Brion, M. J., Henrichs, J., Jaddoe, V. W. V., Hofman, A., Verhulst, F. C., Tiemeier, H. (2013).	Parental depressive and anxiety symptoms during pregnancy and attention problems in children: a cross-cohort consistency study.	Mothers and fathers	L
Velders, F. P., Dieleman, G., Henrichs, J., Jaddoe, V. W. V., Hofman, A., Verhulst, F. C., . . . Tiemeier, H. (2011).	Prenatal and postnatal psychological symptoms of parents and family functioning: The impact on child emotional and behavioural problems.	Mothers and fathers	L

Appendix B - Participant information sheet

INFORMATION SHEET (Version 2, 28.07.2014)

Study title: 'The role of resilience, attachment style and mindfulness in fathers' adjustment to the birth of their child.'

Researcher name: Justyna Fila (Trainee Clinical Psychologist)

Study ID: 9810

We would like to invite you to take part in a research study about expectant fathers. Before you decide if you would like to participate, please take time to read the following information carefully. Please ask us if there is anything that is not clear or if you would like more information. If you are happy to participate you will be asked to sign a consent form

What is the purpose of the project?
We know that men respond to the birth of their baby differently. Therefore, we want to find out which factors help fathers adjust better to the arrival of the new family member. In order to help us do that we will ask you various questions about your experience of the birth of your baby, how you relate to other people or how you deal with difficult situations, your mood, sleep and physical symptoms.
Do I have to take part?

Your participation in the project is entirely voluntary.

What do I have to do if I agree to take part?

We will send you emails with a link to an online questionnaire at 3 different times. The first email you receive will be about a week before your baby's due date. This questionnaire will be the longest and may take you up to 15-20 minutes to fill in. The second email you receive will be approximately 2 weeks after your baby's due date. This questionnaire should take up to 15 minutes to fill in. We would be grateful if you could fill in this questionnaire as soon as possible after your baby is born. We will send you the final email 6 weeks after the second email. The questionnaire should take you up to 10 minutes to complete.

Will my participation be confidential?
We will use the information you give us to find out which factors are linked with better adjustment of fathers to the birth of their baby. The information we collect will also be used for a University of Southampton dissertation as part of a trainee clinical psychologist's doctorate and we may publish the results of the study in an academic journal. However, you will not be identified in any way in reports of this study as all the data will be anonymised. The questionnaires you complete will be kept strictly confidential in a secure computer database. We won't ask for your name and we will instead use a code so that your information cannot be traced to you.
Where can I get more information?

If you have any questions please contact the researcher: Justyna Fila, Trainee Clinical Psychologist at Clinical Psychology Doctorate, Building 44a University Rd, Southampton, SO17 1BJ, or email: jtf1g11@soton.ac.uk.

Appendix B

What if something goes wrong?

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: +44 (0)23 8059 4663, email slb1n10@soton.ac.uk

Appendix C - Consent form

CONSENT FORM (Version 1, 18/04/2014)

Study title: 'The role of resilience, attachment style and mindfulness in fathers' adjustment to the birth of their child.'

Researcher name: Justyna Fila

ERGO Study ID: 9810

Please initial the boxes if you agree with the statement(s):

I have read and understood the information sheet (V1, 18/04/2014) and have had the opportunity to ask questions about the study. ☐

I agree to take part in this research project and agree for my data to be used for the purpose of study by University of Southampton ☐

I understand that my participation is voluntary and that I am free to withdraw at any time until the point when my data is anonymised, without giving any reason and without my medical care or legal rights being affected. ☐

I understand that my data will be stored confidentially in accordance with the Data Protection Act (1998) and University of Southampton Policy. ☐

Name of participant (print name)……

Signature of participant……. Date……..

Appendix D - Study advert

Are you a man expecting the birth of his baby?

First of all- congratulations!

We are looking for volunteers willing to take part in a study which aims to find out what helps men adjust better to the birth of their baby.

We need your help!

Taking part in the study involves filling in a few questionnaires online. That's it!

You will be with a chance to win £30 Amazon vouchers!

If you're interested in finding out more and taking part in the study please go to https://www.isurvey.soton.ac.uk/12102 or contact the researcher Justyna Fila on jtf1g11@soton.ac.uk or 07881742411.

Thank you!

Appendix E - General Health Questionnaire - 28

Please read this carefully.

We would like to know if you have had any medical complaints and how your health has been in general, *over the past few weeks.* Please try to answer ALL the questions.

Question 6.1

Have you recently been feeling perfectly well and in good health?

Better than usual	Same as usual	Worse than usual	Much worse than usual
○	○	○	○

Question 6.2

Have you recently

been feeling in need of good tonic?	○	○	○	○
been feeling run down and out of sorts?	○	○	○	○
felt that you are ill?	○	○	○	○
been getting any pains in your head?	○	○	○	○
been getting a feeling of tightness or pressure in your head?	○	○	○	○
been having hot or cold spells?	○	○	○	○
lost much sleep over worry?	○	○	○	○
had difficulty staying asleep once you are off?	○	○	○	○
felt constantly under strain?	○	○	○	○
been getting edgy and bad-tempered?	○	○	○	○
been getting scared or panicky for no good reason?	○	○	○	○
found everything getting on top of you?	○	○	○	○
been feeling nervous and strung-up all the time?	○	○	○	○

Question 6.3

Have you recently been managing to keep yourself busy and occupied?

More so than usual	Same as usual	Rather less than usual	Much less than usual
○	○	○	○

Question 6.4

Appendix E

Have you recently been taking longer over things you do?

Quicker than usual	Same as usual	Longer than usual	Much longer than usual
○	○	○	○

Question 6.5

Have you recently felt on the whole you were doing things well?

Better than usual	About the same	Less well than usual	Much less well
○	○	○	○

Question 6.6

Have you recently been satisfied with the way you've carried out your tasks?

More satisfied	About the same	Less satisfied than usual	Much less satisfied
○	○	○	○

Question 6.7

Have you recently

felt that you are playing a useful part in things?	○	○	○	○
felt capable about making decisions about things?	○	○	○	○
been able to enjoy your day-to-day activities?	○	○	○	○

Question 6.8

Have you recently

been thinking of yourself as a worthless person?	○	○	○	○
felt that life is entirely hopeless?	○	○	○	○
felt that life isn't worth living?	○	○	○	○

Question 6.9

Have you recently thought about a possibility that you might make away with yourself?

- ○ Definitely not
- ○ I don't think so
- ○ Has crossed my mind
- ◉ Definitely have

Question 6.10

Have you

found at times you couldn't do anything because your nerves were too bad?

found yourself wishing you were dead and away from it all?

Question 6.11

Have you recently found that the idea of taking your own life kept coming into your mind?

Definitely not I don't think so It has crossed my mind Definitely has

Appendix F - Revised Experiences in Close Relationships Scale

The statements below concern how you feel in emotionally intimate relationships. We are interested in how you *generally* experience relationships, not just in what is happening in a current relationship. Respond to each statement by clicking a circle to indicate how much you agree or disagree with the statement:

1. I'm afraid that I will lose my partner's love.

2. I often worry that my partner will not want to stay with me.

3. I often worry that my partner doesn't really love me.

4. I worry that romantic partners won't care about me as much as I care about them.

5. I often wish that my partner's feelings for me were as strong as my feelings for him or her.

6. I worry a lot about my relationships.

7. When my partner is out of sight, I worry that he or she might become interested in someone else.

8. When I show my feelings for romantic partners, I'm afraid they will not feel the same about me.

9. I rarely worry about my partner leaving me.

10. My romantic partner makes me doubt myself.

11. I do not often worry about being abandoned.

12. I find that my partner(s) don't want to get as close as I would like.

13. Sometimes romantic partners change their feelings about me for no apparent reason.

14. My desire to be very close sometimes scares people away.

Appendix F

15. I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am.

16. It makes me mad that I don't get the affection and support I need from my partner.

17. I worry that I won't measure up to other people.

18. My partner only seems to notice me when I'm angry.

19. I prefer not to show a partner how I feel deep down.

20. I feel comfortable sharing my private thoughts and feelings with my partner.

21. I find it difficult to allow myself to depend on romantic partners.

22. I am very comfortable being close to romantic partners.

23. I don't feel comfortable opening up to romantic partners.

24. I prefer not to be too close to romantic partners.

25. I get uncomfortable when a romantic partner wants to be very close.

26. I find it relatively easy to get close to my partner.

27. It's not difficult for me to get close to my partner.

28. I usually discuss my problems and concerns with my partner.

29. It helps to turn to my romantic partner in times of need.

30. I tell my partner just about everything.

31. I talk things over with my partner.

32. I am nervous when partners get too close to me.

33. I feel comfortable depending on romantic partners.

34. I find it easy to depend on romantic partners.

35. It's easy for me to be affectionate with my partner.

36. My partner really understands me and my needs.

Appendix G - Resilience Appraisals Scale

Please indicate how much you agree with each statement:

1. If I were to have problems, I have people I could turn to

2. My family or friends are very supportive of me

3. In difficult situations, I can manage my emotions

4. I can put up with my negative emotions

5. When faced with a problem I can usually find a solution

6. If I were in trouble, I know of others who would be able to help me

7. I can generally solve problems that occur

8. I can control my emotions

9. I can usually find a way of overcoming problems

10. I could find family of friends who listen to me if I needed them to

11. If faced with a set-back, I could probably find a way round the problem

12. I can handle my emotions

Appendix H - 5 Facets Mindfulness Scale

This instrument is based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness as it is currently conceptualized. The five facets are observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. More information is available in:

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1 2 3 4 5

never or very rarely sometimes often very often or

rarely true true true true always true

_____ 1. When I'm walking, I deliberately notice the sensations of my body moving.

_____ 2. I'm good at finding words to describe my feelings.

_____ 3. I criticize myself for having irrational or inappropriate emotions.

_____ 4. I perceive my feelings and emotions without having to react to them.

_____ 5. When I do things, my mind wanders off and I'm easily distracted.

_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my

body.

_____ 7. I can easily put my beliefs, opinions, and expectations into words.

_____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or

otherwise distracted.

_____ 9. I watch my feelings without getting lost in them.

_____ 10. I tell myself I shouldn't be feeling the way I'm feeling.

_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and

emotions.

_____ 12. It's hard for me to find the words to describe what I'm thinking.

_____ 13. I am easily distracted.

_____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that

way.

_____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.

_____ 16. I have trouble thinking of the right words to express how I feel about things

_____ 17. I make judgments about whether my thoughts are good or bad.

_____ 18. I find it difficult to stay focused on what's happening in the present.

_____ 19. When I have distressing thoughts or images, I "step back" and am aware of the

thought or image without getting taken over by it.

_____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars

passing.

_____ 21. In difficult situations, I can pause without immediately reacting.

_____ 22. When I have a sensation in my body, it's difficult for me to describe it because

I can't find the right words.

Appendix H

_____ 23. It seems I am "running on automatic" without much awareness of what I'm

doing.

_____24. When I have distressing thoughts or images, I feel calm soon after.

_____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.

_____ 26. I notice the smells and aromas of things.

_____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.

_____ 28. I rush through activities without being really attentive to them.

_____ 29. When I have distressing thoughts or images I am able just to notice them

without reacting.

_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel

them.

_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or

patterns of light and shadow.

_____ 32. My natural tendency is to put my experiences into words.

_____ 33. When I have distressing thoughts or images, I just notice them and let them go.

_____ 34. I do jobs or tasks automatically without being aware of what I'm doing.

_____ 35. When I have distressing thoughts or images, I judge myself as good or bad,

depending what the thought/image is about.

_____ 36. I pay attention to how my emotions affect my thoughts and behavior.

_____ 37. I can usually describe how I feel at the moment in considerable detail.

_____ 38. I find myself doing things without paying attention.

_____ 39. I disapprove of myself when I have irrational ideas.

Appendix I - Edinburgh Postnatal Depression Scale

Ask patient how they have been feeling OVER THE LAST 7 DAYS, not just today.

1. I have been able to laugh and see the funny side of things

- 0 points - As much as I always could
- 1 point - Not quite so much now
- 2 points - Definitely not so much now
- 3 points - Not at all

2. I have looked forward with enjoyment to things

- 0 points - As much as I ever did
- 1 point - Rather less than I used to
- 2 points - Definitely less than I used to
- 3 points - Hardly at all

3. I have blamed myself unnecessarily when things went wrong

- 3 points - Yes, most of the time
- 2 points - Yes, some of the time
- 1 point - Not very often
- 0 points - No, never

4. I have been anxious or worried for no good reason

- 0 points - No, not at all
- 1 point - Hardly ever
- 2 points - Yes, sometimes
- 3 points - Yes, very often

5. I have felt scared or panicky for no very good reason

- 3 points - Yes, quite a lot
- 2 points - Yes, sometimes
- 1 point - No, not much
- 0 points - No, not at all

6. Things have been getting on top of me

- 3 points - Yes, most of the time I haven't been able to cope at all
- 2 points - Yes, sometimes I haven't been coping as well as usual
- 1 point - No, most of the time I've coped quite well
- 0 points - No, I've been coping as well as ever

7. I have been so unhappy, I have had difficulty sleeping

3 points - Yes, most of the time
2 points - Yes, sometimes
1 point - Not very often
0 points - No, not at all

8. I have felt sad and miserable

3 points - Yes, most of the time
2 points - Yes, sometimes
1 point - Not very often
0 points - No, not at all

9. I have been so unhappy that I have been crying

3 points - Yes, most of the time
2 points - Yes, quite often
1 point - Only occasionally
0 points - No, never

10. The thought of harming myself has occurred to me

3 points - Yes, quite often
2 point - Sometimes
1 point - Hardly ever
0 points - Never

Edinburgh Postnatal Depression Score

= /30

Appendix J - Revised Impact of Events Scale

NAME . . . . . DATE . . . . / . . . . . / . . . . . .

Below is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you **DURING THE PAST SEVEN DAYS** with respect to _____, which occurred on _____. How much were you distressed or bothered by these difficulties?

		FREQUENCY				
		0 Not at all	1 A little bit	2 Moderately	3 Quite a bit	4 Extremely
1	Any reminders brought back feelings about it					
2	I had trouble staying asleep					
3	Other things kept making me think about it					
4	I felt irritable and angry					
5	I avoided letting myself get upset when I thought about it or was reminded of it					
6	I thought about it when I didn't mean to					
7	I felt as if it hadn't happened or it wasn't real					
8	I stayed away from reminders about it					
9	Pictures about it popped into my mind					
10	I was jumpy and easily startled					
11	I tried not to think about it					
12	I was aware that I still had a lot of feelings about it, but I didn't deal with them					
13	My feelings about it were kind of numb					
14	I found myself acting or feeling like I was back at that time					
15	I had trouble falling asleep					
16	I had strong waves of feelings about it					
17	I tried to remove it from my memory					
18	I had trouble concentrating					
19	Reminders caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart					
20	I had dreams about it					
21	I felt watchful and on guard					
22	I tried not to talk about it					

Appendix K - Perceptions of Labour and Delivery Scale

Now please answer the questions below

Overall how pleasurable was your experience of your partner's labour and delivery?	○	○	○	○	○	○	○	○	○	○
At its worst how severe do you think your partner's pain was during labour and delivery?	○	○	○	○	○	○	○	○	○	○
On average how severe do you think your partner's pain was during labour and delivery?	○	○	○	○	○	○	○	○	○	○
How distressing did you find the pain your partner experienced?	○	○	○	○	○	○	○	○	○	○
In general how distressing did you find the overall experience of labour and delivery?	○	○	○	○	○	○	○	○	○	○
How satisfied were you with the way you coped during partner's labour and delivery?	○	○	○	○	○	○	○	○	○	○
How prepared did you feel during your partner's labour and delivery?	○	○	○	○	○	○	○	○	○	○
At its worst how fearful did you feel for your partner during her labour and delivery?	○	○	○	○	○	○	○	○	○	○
At its worst how fearful did you feel for your baby during your partner's labour and delivery?	○	○	○	○	○	○	○	○	○	○
On average how fearful did you feel for your partner during her labour and delivery?	○	○	○	○	○	○	○	○	○	○
On average how fearful did you feel for your	○	○	○	○	○	○	○	○	○	○

baby during her labour and delivery?										
How unexpected to you were the procedures that happened to your partner during her labour and delivery?	○	○	○	○	○	○	○	○	○	○
How confident did you feel about being able to cope during your partner's labour and delivery?	○	○	○	○	○	○	○	○	○	○
How supportive to you were the staff during your partner's labour and delivery?	○	○	○	○	○	○	○	○	○	○
How unwell did you feel during your partner's labour and delivery?	○	○	○	○	○	○	○	○	○	○
How much did you feel in control of what was happening during your partner's labour and delivery?	○	○	○	○	○	○	○	○	○	○
How well-informed did you feel about the progress of your partner's labour and delivery?	○	○	○	○	○	○	○	○	○	○
How much did you feel that your wishes and views were listened to by the staff during your partner's labour and delivery?	○	○	○	○	○	○	○	○	○	○
How much was your experience of your partner's labour and delivery worse than you expected?	○	○	○	○	○	○	○	○	○	○
How much was your experience of your partner's labour and delivery better than you expected?	○	○	○	○	○	○	○	○	○	○
How far did you feel responsible for any difficulties your partner	○	○	○	○	○	○	○	○	○	○

experienced?

How far did you feel staff were responsible for any difficulties your partner experienced?	○	○	○	○	○	○	○	○	○	○
On the whole how well do you feel that you coped with your partner's labour and delivery when compared with other men?	○	○	○	○	○	○	○	○	○	○

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