Experience of Fatherhood in the Post-Natal Period

An examination of parental leave and sense of parenting competence as risk factors for paternal post-natal depression.

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Abstract

An examination of parental leave and sense of parenting competence as risk factors for paternal post-natal depression.

Post-natal depression has been well researched in mothers and has been found to have profound negative effects on both parents and the family unit. Recent findings have also shown that fathers experience postnatal depression at a similar rate to mothers, and this also has negative impacts on the family. Despite this, few studies have investigated factors contributing to the risk of postnatal depression among fathers. Parental leave has been shown to reduce the incidence of depression in both mothers and fathers, although fewer studies of the impact on fathers have been conducted. The aim of the present study was to examine the role of parental leave and sense of parenting competence in depression for first time fathers of a new baby. Fathers whose first child was aged under two years (N=102) completed an online survey comprising of questions about the timing and length of leave taken following the birth of their child, along with measures of depression and sense of parenting competence from the Parenting Stress Index. The data showed that depression was negatively associated with sense of parenting competence. No significant association was shown between leave taken and sense of parenting competence or between depression and leave taken, and no evidence for an indirect association between leave and depression through parenting competence was shown. These findings do not support research in other countries that found an association between increased parental leave and depression. It is possible that the impact of the Covid-19 pandemic influenced these findings.

Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time.

Thomas Parkin

Contribution Statement

In writing this thesis, my supervisors, Dr. Alyssa Sawyer and Dr. Amanda Taylor, and I collaborated to develop the survey used for data collection. This survey contained items from the Parenting Stress Index (Abidin, 2012). My supervisors and I also collaborated to design appropriate analysis of the data.

I conducted the literature search, completed the ethics application and was responsible for the analysis of the data and writing up the thesis.

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Chapter 1: Introduction

Overview

Post-natal depression is serious mental health issue for fathers of newborn children. It has been very well researched in mothers and has been shown to have negative effects on the mother and the broader family unit (Kornfeind & Sipsma, 2018). There is a growing body of research showing that men experience post-natal depression at similar rates to women, and that depression in fathers has a similar impact on the family to depression in mothers. For example a meta-analysis of 74 studies, including over 40,000 participants reported that depression was present in between 7.2% and 9.6% (95% confidence interval) of new fathers (Cameron, Sedov & Tomfohr-Masden, 2016). This is comparable to an estimate of the rate of incidence of postnatal depression in mothers of approximately 13% (O'Hara & Swain, 1996).

While the factors that may contribute to post-natal depression in mothers are well understood, as are effective interventions to treat it, there are fewer studies which have investigated the factors contributing to the risk of post-natal depression among fathers. Because factors such as access to paid or unpaid parental leave, the traditional role within the family unit and historical experience with children are likely to be different for fathers than they are for mothers, this is an important area to research.

The aim of this study was to investigate the whether leave taking behaviour and sense of parenting competence are risk factors for depression in first time fathers in Australia with a new baby. A better understanding of the relationship between these factors could inform decisions about leave policy, or interventions to encourage leave taking or to build fathers' sense of parenting competence, and so reduce the incidence or severity of the associated post-natal depression.

1.1. Impact of post-natal depression in fathers

Post natal depression is defined as a condition of depressive symptoms with an onset in the weeks or months directly before and after childbirth (DSM-5: American Psychiatric Association, 2013). Symptoms of post-natal depression can include an inability to cope with daily routine, poor self-care and a withdrawal from social contact. These symptoms can present differently in fathers than they do in mothers, with fathers more likely to exhibit lower impulse control and display anger and irritability (O'Brien et al., 2017).

When a father experiences post-natal depression, the consequences can be significant and extensive. Men who experience post-natal depression have been shown to have decreased positive attitudes towards their marital relationship, sexual relations and their baby (Pinto, Samorinha, Tendais & Figueiredo, 2020). They report higher levels of marital difficulties (Davey, Dziurawiec, & O Brien-Malone, 2006), increased levels of substance abuse (Biebel & Alikhan, 2016), and there is an association between depression during the post-natal period and greater levels of violence towards their marital partner (Widding, 2000).

The child of a father experiencing post-natal depression may also suffer negative outcomes. Depressive symptoms in fathers during this period have been shown to contribute to a reduced ability for the father to bond with the baby (Parfitt, Pike & Ayres, 2013). In a systematic review of the literature, it was found by Gentile and Fusco (2017) that infants and toddlers of fathers with post-natal depression are more likely to have increased levels of crying, hyperactivity, developmental impairment and social problems. Older, school age children are twice as likely to suffer from specific psychiatric disorders, for example, 12% of children whose father suffered from depression were diagnosed with a psychiatric disorder,

compared to 6% of children whose fathers had not been depressed (Ramchandani et al., 2008).

A systematic review of the literature examining effective treatments for post-natal depression in fathers revealed that cognitive behavioural therapy (CBT) is the most commonly applied treatment for the condition, but that treatment has been based on therapies developed for treating post-natal depression in women (O'Brien et al., 2017). O'Brien et al. found that there was very little literature that specifically addresses the treatment needs of fathers. It is hoped that by building on the body of work identifying the contributing factors for post-natal depression in fathers, a contribution can be made towards the efforts to develop effective, father specific treatments for this condition.

1.2 Factors affecting the development of depression in fathers.

To date much of the research investigating risk factors for depression in fathers has focused on factors such as a history of mental health diagnoses and socio-economic conditions (Ansari, Shah, Dennis & Shah, 2021). In a systematic review of literature including 25 studies encompassing almost 1,400 fathers whose child was born in the previous 12 months, Ansari et al. (2021) also found that in addition to those factors identified above, parenting stress is a significant risk factor (pooled OR 1.06, 95% CI 1.02–1.11; I^2 = 5%) associated with depression in fathers. A low sense of parenting competence was also identified as a risk factor (pooled OR of 1.27 95% CI 0.73–2.20; I^2 = 71%) for depression in the same study. This study hopes to further explore the relationship between sense of parenting competence and post-natal depression in first time fathers.

1.3 Leave and depression

There is evidence in the literature to suggest the access to parental leave is a key factor that can affect the development of both parenting competence and postnatal depression (Petts, 2020). Particularly for women there is clear evidence that increasing access to parental leave is associated with decreased levels of depression (Kornfeind & Sipsma, 2018). In their study of 177 women who had returned to full time work after having a baby in North America, Kornfeind and Sipsma (2018) reported that for women who took less than 12 weeks of maternity leave, each additional week of leave was associated with a reduction in levels of post-natal depression (OR, 0.58; 95% CI, 0.40–0.84). In contrast the role of access to parental leave for fathers in the development of parenting competence and postnatal depression is less well described. There have been few studies to date have examined this issue. One study that has explored this area was a study of 100 fathers in Ireland (Philpott & Corcoran, 2018) which reported that employed fathers who did not have access to paternity leave had a prevalence of post-natal depression of 19.4% using the Edinburgh Post Natal Depression Scale, compared to a prevalence among those who did access leave of 4.2% *(p* = .025). In an Australian study of 3,912 fathers of children who had been born in the previous 12 months, Giallo et al. (2013) concluded that having access to paid family leave and flexible work hours may give fathers the ability to adjust to the demands of parenting and spend more time caring for their child. This study hopes to explore the conclusion of Giallo et al. (2013) and quantify the effect of leave on fathers parenting capabilities.

The taking of paternity leave is associated with other aspects of parental relationships and the family unit that have been shown to be associated with post-natal depression. There is evidence that amount of parental leave taken around the time of the birth of a child has an impact on the health of parents, the child and the family unit. For example, in a study of parental leave taking behaviour across 35 OECD countries between 1990 and 2016 it was found that a mother having access to paid maternity leave is associated with decreases in the

neo-natal mortality rate, the infant mortality rate and the mortality rate for children under 5 (Kahn, 2020). Similarly, for each increase of one week of paid paternity leave associated reductions in the incidence of infant mortality and the mortality rate for children under 5 were observed.

In addition to the physical health of children, fathers taking paternity leave has been shown to have a positive influence on the emotional development of their children. Using data from the Early Childhood Longitudinal Study – Birth Cohort in the United State, it was found that children of fathers who took 2 or more weeks of parental leave when they were born report that they are closer to their father and have better communication with him (Petts, 2020).

Taking paternity leave has also been shown to have a beneficial impact on the relationship stability of the parents. Mothers whose partner has taken more than 2 weeks of parental leave at the time of the child's birth report higher levels of relationship satisfaction and greater levels of co-parenting support than those whose partner takes less than 2 weeks (Petts, 2020). These findings reinforce earlier work by Rehel (2014) who found that fathers that took 3 or more weeks of leave demonstrated attitudinal and behavioural change in relation to their parenting. The study of Rehel (2014) will be described in greater detail below.

Jurisdictions differ significantly in their approaches to the amount of paternity leave available to new fathers. The average amount of leave offered to fathers in the OECD is just 3 days, compared with the 15 weeks of maternity leave that is available to new mothers (Kahn, 2020). Several large countries, including the USA, Canada, Germany and Japan, offer no paid paternity allowances. The most generous paternity leave provision among OECD countries is in Portugal, where fathers enjoy 5 weeks of paid leave. In Australia a provision of 2 weeks of paid paternity leave was enacted in 2013, and yet despite this entitlement figures from the Australian Bureau of Statistics show that just 5% of parents taking primary

carer's leave are fathers. (ABS, 2019). The ability of fathers to access legislated leave entitlements is influenced by their individual employment conditions, with those fathers in full time permanent work more likely to access parental leave than those in part time or casual employment. This study hopes to understand the outcomes of leave taking behaviour in Australia as it relates to the incidence of post-natal depression in fathers, and to demonstrate the benefit of the use of paternity leave provisions to inform education campaigns or interventions to encourage the taking of paternity leave.

1.4 Sense of Parenting Competence and its relationship with depression in the Post Natal Period

The construct of sense of parenting competence is used interchangeably with the term sense of parenting self efficacy in the literature, and is usually defined as "..the extent to which the parent feels comfortable and actually is capable in the parenting role." (Abidin, 2012). There have been a number of studies that have linked this construct of sense of parenting competence to post-natal depression in fathers. In a Swedish study of 530 men whose partner had given birth in the preceding 18 months, Psouni & Eichbichler (2020), sought to investigate whether sense of parenting competence mediated a relationship between attachment anxiety and post-natal depression in fathers. They used an instrument called the Swedish Parenthood Stress questionnaire that includes an 11 item subscale called the Incompetence Regarding Parenthood scale which captures feelings of parental incompetence. That study reported that there was a significant association between Incompetence Regarding Parenthood and Depression ($\beta = .47$, $p < .001$).

While not investigating depression specifically, in the Australian study referred to above (Giallo et al., 2013), a measure of psychological distress in fathers was defined by the Kessler-6 scale. Giallo et al. found that a father's psychological distress was associated with the characteristic defined as low parental self-efficacy (OR 1.07; 95 % CI 1.03–1.12). The current study hopes to demonstrate that this relationship also exists between sense of parenting competence and depression for an Australian cohort.

Similarly, in a study of 205 Canadian fathers whose breast fed children were between the ages of 8 and 16 months, deMontingny (2013) used the Edinburgh Postpartum Depression Scale to measure levels of depression and the Parent Expectations Survey to measure Perception of Paternal Parenting Efficacy. She reported that fathers who are depressed had a lower score for perceived parenting efficacy than those who were not depressed (M=7.47 vs M=8.36; $p \leq 0.0001$).

Feldman, Sussman & Zigler (2004) conducted a study of 98 dual income parents whose children were between 3 and 5 months old, and who had both returned to work. The study used the Beck Depression Inventory to assess levels of depressive symptoms in both parents. It was found that fathers who had taken more leave when their child was born had a greater knowledge of infant development and had higher score for family salience. These traits were both associated with lower incidences of depression in fathers (Feldman, Sussman & Zigler, 2004). Petts (2020) conducted a study of 1,319 mainly socioeconomically disadvantaged families in The United States of America. He found that fathers who has taken two or more weeks of leave at the time of their child's birth were more likely to be closer to their child, and 6-10% of the variance in that measure was due to what Petts described as "Good Father" identities. He surmised that taking parental leave allows fathers to develop an identity as a

caring, engaged and capable parent and in doing so become more confident, and committed to their role as a parent (Petts, 2020). Petts also found that fathers who took 2 or more weeks of leave rated themselves as better fathers than those who took less than 2 weeks of leave, supporting the notion that there is a threshold of leave taking over which fathers exhibit emotional and attitudinal change towards parenting.

This study will build on those findings which demonstrate the relationship between leave and sense of parenting competence, and investigate whether it can be shown in an Australian cohort.

1.5 The mediating effect of sense of parenting competence on the relationship between leave and depression

Using data from a Longitudinal Study of Australian Children (LSAC), Giallo et al. (2013), analysed the responses of over 3,912 biological fathers who resided with their infant child in Australia. Their level of psychological stress was measured using the Kessler-6 scale. A measure of job quality was also taken using an index that consisted of four measures: paid family friendly leave, flexible hours, job control and job security with a higher score indicating a higher "quality" job. Parental self-efficacy was assessed by a self report survey asking questions about the participants beliefs about their competence as a parent, with higher scores indicating a higher level of self-efficacy. The study found that decreased parenting self-efficacy was associated with higher symptoms of psychosocial distress, and that lower 'quality' jobs were strongly associated with psychosocial distress in fathers of newborn children. It was found that those fathers with the lowest quality jobs had five times the risk of poor mental health than those in the highest quality jobs. This study will seek to tease out one component of that job quality construct, namely the taking of paternity leave, and test its association with mental health in first time fathers of young children. It will also seek to

explore the relationship between fathers' mental health and parenting self-efficacy in greater detail.

In his study conducted in Ireland (Philpott & Corcoran, 2018) also sought to determine factors associated with paternal post-natal depression. In that study, 100 first time fathers of children under 12 months old completed a questionnaire that included the Edinburgh Postnatal Depression scale. Their leave taking was recorded as a dichotomized variable, as either having received paternity leave, or not having received paternity leave. The study found that among those fathers that had a job, 19% of those who did not receive paternity leave reported post-natal depression, compared to 4.2% of fathers who did take paternity leave . This suggests that access to paternity leave may directly affect level of depression during the postnatal period. This study hopes to explore the mechanism by which that paternity leave influences fathers' mental health.

One particular study that has provided evidence suggesting that parenting competence is a factor in the effect of leave on post-natal depression was conducted by Rehel (2014). In a qualitative study in North America (Rehel, 2014) the researcher interviewed 85 fathers and mothers that worked for a single company across multiple sites, that had generous parental leave provisions. Rehel (2014) was particularly interested in whether fathers were capable of taking on some of the roles related to raising children that were traditionally considered to be the roles of mothers. Her findings included two results that are of interest for this study. The first was that there is as threshold of leave at which the attitudes and behaviours of a father changed in relation to his role as a parent. She concluded that this threshold was three weeks of leave, so those fathers that took three or more weeks of leave showed changes in their attitudes and behaviours. The second finding of interest was in the nature of the attitude change brought about by leave taking behaviour. Rehel (2014) found that fathers who took

less than three weeks of leave saw themselves in a support role for the mother in her capacity as primary carer for their child. Fathers who took three or more weeks of leave were likely to develop a relationship with the mother of their child in which they share responsibility for child rearing. They developed the skills and confidence – i.e. sense of parenting competence – to play a role as a genuine co-parent. Petts (2020) examined data from a longitudinal study in America of families to test whether or not leave taking by fathers around the time of their child's birth had a positive effect. He found that longer lengths of leave taking (defined in that study by two weeks or more) was associated with improved relationships between the father and child, and had an impact on fathers' "identities". This supports the notion that there is a threshold of leave at which fathers' attitudes and behaviours change in relation to their parenting role.

This study aims to quantify the effect of leave taking behaviour on a specific aspect of fathers' attitudes, being sense of parenting competence, among a cohort of Australian fathers. Given that the availability of leave to fathers in Australia is less that seen in other countries, and that leave availability varies greatly depending on the nature of a fathers' employment in Australia, understanding that sense of parenting competence is a driver of the relationship between leave and depression may allow for interventions when leave taking is not possible. Education programs or support networks could be developed to build a sense of parenting competence in new fathers.

1.6 Aims and Hypothesis

This study will explore the relationship between the amount of leave taken by fathers, their sense of parenting competence, and levels of depression.

Hypotheses

1. There will be a lower mean score for the Sense of Parenting Competence subscale of the Parenting Stress index among those fathers that have taken three or more weeks of leave in the first six months of their first child's life. A lower score on this scale represents a higher sense of competence.

2. There will be a lower mean score for the self reported level of depression among those fathers that have taken three of more weeks of leave in the first six months of their first child's life.

3. The relationship between leave taken in the first six months of their first child's life and father's self reported level of depression will be mediated by father's sense of parenting competence. That relationship is demonstrated below in figure 1.

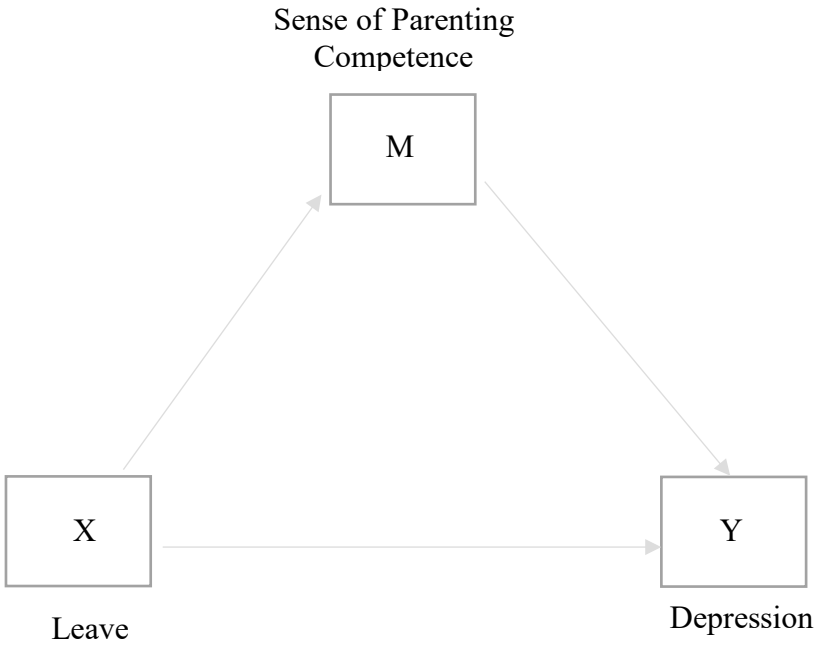

Figure 1. Mediation model for the direct and indirect relationship between Leave and Depression.

Chapter 2: Methods

2.1 Participants

The participants in the study were fathers whose first child had been born within the previous two years. Participants were recruited through Qualtrics Market Research Panels, and they received a modest compensation, in acknowledgement of the time taken to complete the study. A total of 102 fathers (mean age = 31.08, SD = 6.1) completed a survey of self report measures via an online survey platform Qualtrics (www.qualtrics.com). The questionnaire could be completed either on a desktop or mobile device, and at a time and place of the participant's choosing. Inclusion criteria were (a) identified as male gender (b) aged over the age of 18 years, (c) first child was born in the previous 2 years, and (d) proficient in English.

Participation in the survey was voluntary, and all participants gave consent to participate.

2.2 Measures

The present survey was part of a larger project investigating experiences of fatherhood, service use and needs for first time fathers. Only those measures that were used for the present study will be discussed here.

2.2.1 Parental Leave Following Childbirth

The amount of leave taken during the first year of the child's life was measured in number of weeks. This is consistent with existing studies examining paternity leave (Knoester, Petts & Bragg, 2019; Petts, Carlson & Knoester, 2020; Petts, Knoester & Waldfogel, 2020). Participants were questioned on how much leave was taken in the first 6 months after the

birth of their child. They were asked "How many weeks of leave did you take in the first 6 months of your child's life?".

Given the findings of Rehel (2014) that 3 weeks is an important threshold in the level of leave taken, leave was then converted into a dichotomous variable with the value 0 given to those who took less than 3 weeks of leave in the first 6 months of their child's life, and 1 given to those who took 3 or more weeks of leave over that same period.

2.2.2 Sense of Parenting Competence

Outside of the questions that related specifically to the amount of leave taken in the first year of their child's life, the items in the survey comprise of the Parent Domain of the Parenting Stress Index (PSI). The PSI was first developed in 1983 by Richard R. Abidin, EdD. It is currently in its 4th edition, with the most recent having been released in 2012. It was inspired by a desire to provide paediatric doctors with a tool that would help them recognise which children they should spend time with, which they should refer to a specialist and which did not require intervention. Abidin (2012) found high levels of parenting stress to be positively associated with a higher probability of dysfunctional parenting behaviour, and also the presence of diagnosed child psychopathology. The tool provides a mechanism for clinicians to identify specific parenting stressors to assist with selecting appropriate interventions.

Father's sense of parenting competence was assessed using the '…' subscale of the parenting stress index (PSI). The PSI is a widely used measure for…. . It comprises subscales that assess factors considered to be connected to parental stress, including personal factors related to the parent (e.g., sense of isolation, competence..) and factors connected to perceptions of the child and the parent-child relationship (e.g., ….).

The competence subscale of the PSI was designed to assess the respondent's sense of competence as a parent. It explores the perceived ability of a parent to regulate their child's behaviour and their confidence in their decision making in relation to their child. It includes 13 items such as "Being a parent is harder than I thought it would be" and "I can't make decisions without help". Responses options were on a 5 point Likert type scale ranging from 'strongly agree' to 'strongly disagree' (SD). Possible scores on this subscale range from 13 to 65, with higher scores on this subscale indicating a lower sense of competence. If a parent scores equal to or greater than 42 may suggest that the parent may need emotional support and practical knowledge about how to manage their child. (Abidin, 2012). In measuring the internal consistency of the competence subscale of the parenting stress index it is reported to have a Chronbach's alpha coefficient of .86. In the current study, the alpha coefficient was found to be .66. The internal consistency of this measure was deemed to be adequate.

Rigorous reliability testing has been calculated for each sub-scale, the parent domain and for the total stress score using Cronbach's Alpha.

The resulting coefficients were based on the responses from the normative sample, and show a high degree of internal consistency for the PSI. Chronbach's Alpha ranged from .75 to .88 for the subscales of the parent domains. The reliability coefficients for the parent domains and the Total Stress scale were greater than .96 (Abidin, 2012).

Test – retest reliability was measured by testing a sample of 30 mothers, and re-testing them 1-3 months later. Correlation coefficients between the two tests were .91 for the parent domain and .96 for the total stress score.

A test of reliability over a longer time scale showed significant correlation between test scores over a 1 year period, indicating that there is test – retest reliability over 1-3 months and one year. (Hamilton, 1980 as cited in Abidin, 2012)

2.2.3 Post-natal depression symptoms

Symptoms of depression for fathers was measured using the depression subscale of the PSI. This contains 9 questions that mainly explore how the respondents feel about interactions with their child. Questions include "I feel every time my child does something wrong, it is really my fault", and "I often feel depressed and do not have the energy to handle my parenting responsibilities." Responses to the questions in the depression subscale were scored in accordance with the scoring sheet that forms part of the PSI to give a depression score.

Possible scores range from 9 to 45 with a higher score on the depression subscale indicating a greater level of depressive symptoms, with a score of 30 or more being in the 85th percentile for parents of children aged 2 years. While high scores on this subscale suggest the presence of depression in the parent, there is not a specific cut off score that indicates possible depression. The mean score for fathers (n=519) in the normative sample for the depression subscale was 18.9, SD = 7.1.

The depression subscale has been shown to be significantly correlated with validated and widely used measures of depression such as the Beck Depression Inventory (Abidin, 2012) and the CES-D with correlations of up to .76. (Archer, Stredny & Wheeler, 2013). It should be noted that the Parenting Stress Index items focus on the parent's interactions with their child, rather than on broader health and non child related behaviours. In measuring the

internal consistency of the depression subscale of the parenting stress it is reported to have a Chronbach's alpha coefficient of .87. In the current study, the alpha coefficient was found to be .90.

2.3 Procedure

The research protocol for this study was approved by The University of Adelaide Human Research Ethics Subcommittee in the School of Psychology (approval number 21/40). Participants accessed the survey through Qualtrics (Qualtrics.com). A preamble included a participant information sheet which explained the reasons for and details of the study. It also included information about the anonymity of the data that was collected and contact information should they have any questions or complaints about the conduct of the study. Details of mental health support services (Beyond Blue, Lifeline and Perinatal Anxiety and Depression Australia) were provided, and participants were encouraged to contact them if they felt any discomfort as a result of being asked questions that related to parenting and mental health. On average it took each participant 30 minutes to complete the 88 questions that made up the survey, and no identifying information was required for the purpose of the study.

2.4 Statistical Analysis

All analyses were conducted using SPSS (IBM Corp., 2020). The first hypothesis, that there will be a lower mean score for the Sense of Parenting Competence subscale of the Parenting Stress index among those fathers that have taken three or more weeks of leave in the first six months of their first child's life, was tested using a comparison of the means of the two

groups. The same methodology was used to test the second hypothesis, that there will be a lower mean score for the self reported level of depression among those fathers that have taken three of more weeks of leave in the first six months of their first child's life.

Regression analysis was used to examine the third hypothesis, that the relationship between leave taken in the first six months of their first child's life and father's self reported level of depression will be mediated by father's sense of parenting competence.

A test of the significance of direct and indirect effects was conducted using bootstrapping methodology and the SPSS Macro PROCESS described by Hayes (2017). Bootstrapping to 10,000 sample replicates was used, allowing for an output of standard error and a bias corrected confidence interval of the mediation effect. A 95% confidence interval was selected to identify significant mediation effects. Total direct and indirect effects were reported.

Chapter 3: Results

3.1 Data Analysis

An initial study of the data revealed that there were no incomplete responses that would have required the removal of the participants. As a result, all respondents (n=102) were retained for the purposes of the subsequent statistical analysis.

A power analysis was conducted prior to the conduct of this study, with parameters set at power = .8, effect size r = .3 and significance level p = .05. The analysis showed that a sample of approximately 85 respondents would be required to detect that correlation, and so this study was considered to be sufficiently powered.

Outliers were assessed using the outlier labelling rule, in which the interquartile ranges were multiplied by 1.5 and added to and subtracted from the upper and lower quartile values respectively. Scores outside of this range were considered to be outliers (Tuckey, 1977, Hoaglin & Inglewicz, 1987). Two respondents were identified whose leave taking behaviour was outside the parameters defined by that analysis. After visual inspection of the responses of those participants, it was determined that they were indeed genuine responses. Separate analyses were run including and excluding these data, and these suggested that the inclusion of the outliers did not significantly affect the results. As such they were not excluded from the data.

The assumption of normality of distribution was tested for the main study variables of leave , sense of parenting competence, and depression, using the Kolmogorov-Smirnov (K-S) test

(Pallant, 2016). For each of these variables, the K-S test was significant, indicating that the assumption of normality that requires a non-significant K-S test had been violated. Following examination of the histograms for each of the variables, it was confirmed that each of the variables were not normally distributed, and non-parametric tests were selected for further analysis . A binary categorical variable was computed for leave, with levels defined by less than three weeks leave, and 3 or more weeks of leave. The threshold of three weeks of leave as a tipping point attitude and behaviour change in fathers was established by Rehel (2014) .

3.2 Sample Characteristics

Table 1. sets out the descriptive statistics for the participants in the study. The mean age for respondents in the current study was 31.08. In an Australian longitudinal study of Australian fathers, it was determined that the mean age of first time fathers in Australia is 33 (MacDonald, 2021). The proportion of male children was 75%, and 36% of participants responded that the child was of Aboriginal or Torres Strait Islander descent, compared to 3.3% of the Australian population (ABS, 2019). 13% of the fathers that participated reported having a previous diagnosis of depression, compared with 10.3% in the general population (Goldney, Eckert, Hawthorne & Taylor, 2010). Depression rates in have been observed to be higher during the period in which this survey was conducted due to the effects of the Covid-19 pandemic (Guvnec et al., 2021, Iyengar, Jaiprakash, Haitsuka & Kim, 2021).

Queensland is under-represented in the geographic spread of respondents, with only 4.9% of participants being from Queensland, compared to 20.1% of the population (ABS, 2019).

South Australia is over-represented, with 28.4% of participants, compared to 6.9% of the population.

The Australian Bureau of Statistics (2019) reported that 69% of Australians aged between 20 and 64 had a non-school qualification, and 68% of men in that age bracket had completed a qualification post school. In the current study, 84.4% of participants reported completing either a trade or tertiary qualification.

The ability to raise $2,000 in an emergency was used as a proxy for a test of socio-economic status and 91% of respondents reported that they could do that easily or with sacrifice. This compares to 78% in the general population (Marjolin, Muir, Ramia & Powell, 2017).

Table 1

Demographic characteristics of responding fathers at different levels of the leave variable.

Characteristic	**Whole sample (n=102)**	**3 + weeks of leave**	**< 3 weeks of leave**
Paternal age (years), mean (Standard Deviation)	31.08 (6.1)	30.7 (5.6)	33.6 (11.8)
Male Child, n (%)	76 (74.5)	66 (75)	10(71)
Child Indigenous, n (%)	37 (36)	30 (34)	7 (50)
State of Residence, n (%)			
NSW	31 (30.4)	29 (33)	2 (14)
Victoria	31 (30.4)	26 (29)	5 (36)
Queensland	5 (4.9)	4 (5)	1 (7)
South Australia	29 (28.4)	23 (26)	6 (43)
Western Australia	4 (3.9)	4 (5)	0 (0)
Tasmania	1 (1.0)	1 (1)	0 (0)
ACT	0 (0)	0 (0)	0 (0)
NT	1 (1.0)	1 (1)	0 (0)
Age of child, n (%)			
Less than 12 months old	73 (72)	64(73)	9 (64)
Older than 1 year but less than 2 years old	29 (28)	24 (27)	5 (36)
Employment status prior to child's birth, n (%)			
Full time paid employment (30+ hrs per week)	96 (94)	84 (95)	12 (86)
Part time paid employment (<30 hrs per week)	4 (4)	3 (3)	1 (7)
Looking for paid work	2 (2)	1 (1)	1 (7)
Father's highest level of education, n (%)			
Secondary School up to year 11 (Including Cert. I or II)	4 (3.9)	3 (3)	1 (7)
Secondary School up to year 12	12 (11.8)	12 (14)	0

Certificate III/IV (trade, apprenticeship, technician's etc)	21 (20.6)	19 (22)	2 (14)
Diploma	12 (11.8)	11 (12)	1 (7)
Bachelor Degree	27 (26.5)	26 (30)	1 (7)
Post-graduate qualification	26 (25.5)	17 (19)	9 (64)
Ability to raise $2,000 in an emergency n (%)			
Easily	77 (76)	67	10
With Sacrifice	16 (16)	14	2
Drastic Measures needed	8 (8)	7	1
Could not do it	1 (1)	0	1

3.3 Measures

3.3.1 Leave taken in first 6 months of child's life

In her 2014 study of fathers leave taking behaviour in Canada, Rehel (2014) found that 76% of fathers with access to leave through progressive family leave policies took leave. This figure compares to the 86% of fathers in the current study who took 3 or more weeks of leave.

3.3.2 Self-reported depression scores

The Parenting Stress Index (PSI) (Abidin, 2012) is published with normative data detailing the percentile range for respondents within each of the subscales measured. Separate percentile ranges are provided for parents of children of different ages. For example there is a scale for parents of children in their first year, and another for children aged between 1 and 2 years. The 50th percentile score for the depression subscale of the PSI for parents of children aged less than one year, and for parents of children aged between 1 and 2 years is

17. Further, the mean depression score for all fathers in the normative sample was 18.9 (Abidin, 2012). The mean scores in our study for fathers who had taken 3 or more weeks of leave in the first 6 months of their child's life was 26.3 and for fathers who had taken less than 3 weeks of leave it was 25.2. This would place them in the 86th percentile and the 80th percentile respectively on the scale for children under 1 yr old, and the 71st and 72nd percentile for children between 1 and 2 years.

3.3.3 Sense of parenting competence

The 50th percentile score on the PSI for sense of parenting competence is 27 for parents of children under the age of 1, and 30 for parents of children between the ages of 1 and 2. The mean scores in our study for fathers who had taken 3 or more weeks of leave in the first 6 months of their child's life of 33.5 and for fathers who had taken less than 3 weeks of 35.5 would place them in the 64th percentile and the 67th percentile respectively on the scale for children under 1 yr. old, and the 61st and 62nd percentile for children between 1 and 2 years. The mean score on the competence subscale of the Parenting Stress Index for fathers in the normative sample was 29.9 with a standard deviation of 8.2.

3.4 Comparison of means.

Given that depression and sense of parenting competence were found to be not normally distributed , the non-parametric Mann-Whitney test was selected to assess whether there was difference between the means of depression and sense of parenting competence at the two levels of the leave variable for depression and sense of parenting competence. It was found that self reported depression scores for fathers who took less than three weeks of leave in the

first 6 months of their first child's life were not significantly different to self reported depression scores of fathers who took 3 or more weeks of leave, U=551, p=.53.
Sense of parenting competence scores for fathers who took less than three weeks of leave in the first 6 months of their first child's life were not significantly different to sense of parenting competence scores of fathers who took 3 or more weeks of leave, U=499, p=.254.

3.5 Mediation analysis

The PROCESS macro for SPSS (Hayes, 2017) was used to perform mediation analyses to investigate whether Sense of Parenting Competence mediates the relationship between parental leave taken in the first 6 months of a child's life and self reported post-natal depression in fathers. The direct effect of parental leave taken in the first 6 months of a child's life on self reported post-natal depression was not statistically significant (b = 2.65, se = 1.82, t = 1.45, p = .149), while a significant direct effect was shown for sense of parenting competence on self reported post-natal depression (b = 0.76, se = 0.11, t = 6.82, p < .01). There was no significant indirect effect of parental leave taken in the first 6 months of a child's life on self reported post-natal depression through sense of parenting competence (bootstrap [95% CI] = -3.58 – 0.334), thus the proposition that the relationship between parental leave taken in the first 6 months of a child's life and self reported post-natal depression was mediated by sense of parenting competence was not supported by the data.

Chapter 4: Discussion

4.1 Overview

The current study aimed to investigate the relationship between leave and depression for fathers in the post-natal period. As sense of parenting competence and leave have both been identified in the literature as being associated with depression in fathers, sense of parenting competence was explored as a mediator, in the belief that the taking of leave around the time of the birth of the child would improve fathers' confidence in their own capabilities to attend to the needs of their new baby. The study found that the data did not support the three hypotheses:

1. There was not a lower mean score for the Sense of Parenting Competence subscale of the Parenting Stress index among those fathers that have taken three or more weeks of leave in the first six months of their first child's life.
2. There was not a lower mean score for the self reported level of depression among those fathers that have taken three of more weeks of leave in the first six months of their first child's life.
3. The relationship between leave taken in the first six months of their first child's life and father's self reported level of depression was not found to be mediated by father's sense of parenting competence.

4.1 Levels of depression and sense of parenting competence in the sample

The mean self reported depression scores reported for the fathers in the sample were higher than anticipated when compared to the scores of the fathers that form the normative sample

of the Parenting Stress Index. When developing the normative data for the Parenting Stress Index Abidin (2012) found that those respondents with a higher level of education, or with higher income levels had lower self reported depression scores. The sample from this study included a high proportion of tertiary educated respondents, and a high skew on our item that acted as a proxy for socioeconomic status, and yet the mean self reported depression score was higher than the mean of the normative group. It is possible that the Covid-19 pandemic may have had an influence on the depression scores in our group of respondents. Our cohort was selected from those Australian fathers whose first child was born in the two years leading up to June 2021, which means that the period for which they reported leave incorporated the periods of national and state based lockdowns, imposed by state governments in an effort to slow the spread of Covid-19. The time during which they self reported their depression levels was a time when there was great uncertainty over public health, individual freedoms and economic stability. Recent studies examining the impact of Covid-19 on new parents suggest that parenting during the Covid pandemic is affecting mental health. In a cross-sectional study of post-partum women in Turkey (Guvenc et al., 2021), 212 new mothers completed the Edinburgh Postnatal Depression Scale. Guvenc et al. found that 34% of these mothers self reported scores on that scale that would suggest that they are suffering from post-natal depression, compared to 23.8% prior to the pandemic. This difference was found to be statistically significant ($p<.001$). In a systematic review of the literature, Iyengar, Jaiprakash, Haitsuka & Kim (2021) found similar increases in rates of post-natal depression in populations of mothers around the world, and that while research into the impact on the mental health of fathers has not been conducted, it seems reasonable to hypothesise that the mental health fathers of newborn children could also have been similarly affected by Covid-19.

Given that a higher score on the parenting sense of competence scale means a lower sense of parenting confidence, our sample is showing a low mean sense of parenting competence when compared to the fathers in the normative group of the Parenting Stress Index. As a result of the Covid-19 pandemic, all states of Australia endured a lockdown of around 6 weeks between April and June 2020. Those fathers in our survey who live in Victoria (30.4%) were confined to their homes for a further for 4 months leading up to October 2020. While some participants in the survey may have been essential workers and would not have been required to be at home full time, all respondents were under some form of stay at home order for additional days or weeks in the time period covered by this study. If the hypothesis that increased levels of leave for fathers of new babies led to increased sense of competence were true, a higher than expected sense of parenting competence would be anticipated over this period given the amount of time fathers would have been around their children during the restrictions to social movement. (i.e. the mean score for sense of parenting competence should have been lower than the 50^{TH} percentile in the normative sample). As the threshold for which time spent at home with a new baby brings attitudinal and behavioural change in new fathers is 3 weeks (Rehel, 2014), it would be reasonable to surmise that with between 6 and 22 weeks at home full time during the pandemic lockdowns many fathers would have exceeded the threshold requirements for time spent with their child and made those behavioural and attitudinal changes to become more capable attending to the needs of their young child, and a genuine co-parent.

One possible reason that this change was not reflected in the sense of parenting competence score may be that the causal nature of the relationship between sense of parenting competence and depression is not what was hypothesised. In their Swedish study of new fathers, Psouni & Eichbichler (2020) were able to demonstrate an association between post-

natal depression in fathers and their sense of parenting competence. Because time spent by fathers with their child does not appear to have led to a improvement in sense of parenting competence in this current study, the evidence suggests that a higher score on the sense of parenting competence sub-scale may have been driven by the depression score, and not the other way around. It may be valuable to further investigate the nature of this relationship.

It is also possible that the fathers who were spending more time at home during the Covid-19 pandemic did not spend much of that time in caring for their child, as they saw themselves as still working, but from home. This may have prevented them from developing the attitudinal change from being a support person to the mother, and becoming a genuine co-parent.

4.2 Association between Leave Taking and Depression

That there is a negative association between leave taking in the post-natal period and depression has been consistently demonstrated in the literature. For mothers who have taken less than 12 weeks of maternity leave, each additional week of maternity leave taken is associated with a reduction in levels of post-natal depression (Kornfeind & Sipsma, 2018). Although less work had been done examining post-natal depression in fathers, studies have shown that a similar effect exists for new fathers (Philpott & Corcoran 2018, Giallo et al., 2013). This effect has not been replicated in the current study. The ability to identify the effect on depression due to the amount of leave taken in the current research may have been compromised by the fact that all fathers who were not deemed to be essential workers were required to work from home for significant periods during the time covered by the study. As discussed above, the measure of depression was also affected by the ongoing health crisis. Depression scores among new parents were higher during the pandemic due to reasons not

related to leave or sense of parenting competence (Iyengar, Jaiprakash, Haitsuka & Kim, 2021). This study was not able to separate the effect of leave on depression from the other broader societal impacts. It is recommended to repeat the study at a time when leave and depression are not being so significantly affected by external forces. That would provide insight not only into the impact of leave on depression in Australia, but also on the impact of the Covid-19 pandemic on post-natal depression.

4.3 Association between leave taking and sense of parenting competence.

There is some support in the literature for the hypothesis that taking paternity leave will result in an improvement in a father's sense of parenting competence. Feldman, Sussman & Zigler (2004) found that fathers who took more leave when their child was born had a greater knowledge of infant development and higher family salience. Petts (2020) found that fathers who took two or more weeks of leave at the time of their child's birth were closer to their child, became a more engaged and capable parent and felt more confident in the role.

The current study did not show an association between leave taking and sense of parenting competence. The possibility that an effect was not found due to the fact that there were not enough participants that took leave was considered, as only 5% of parents in Australia that take parental leave are fathers (ABS, 2017). 86% of the fathers in the sample took 3 or more weeks of leave in the first 6 months of their child's life, so it was considered that sufficient respondents took leave to have a reasonable chance of detecting an effect if it existed. The dose-effect relationship between leave taking and sense of parenting competence was also investigated. Previous studies have found that between 2 weeks (Petts, 2020) and 3 weeks (Rehel, 2014) of leave around the time of a child's birth is sufficient to effect attitude and

behaviour change in relation to a father's parenting role. The current study held that the cut off for leave would be 3 weeks.

The items of the parenting sense of competence subscale of the PSI contain questions relating to the highest level of education completed by each of the child's parents, and these refer to qualifications which could be considered to be more relevant to an American context. Because of this, the current study also included items that asked the questions relating to education using language around qualifications more relevant to an Australian context, and found no significant difference between the responses to the items. The issue of social desirability bias was considered, however the distribution of competence scores (while not normal) were not highly skewed, and the sense of competence scores were worse than anticipated. It was considered to be unlikely that respondents to the survey would feel social pressure to report a lower sense of parenting competence, and so social desirability bias was not thought to have affected the outcome. While the possibility that fathers spent leave time doing things other than parenting was also countenanced, the fact that the relevance of the amount of leave taken may have been reduced by forced stay at home orders during the Covid-19 pandemic should not be overlooked. The association between leave taking behaviour and parenting sense of competence should be tested again outside an extended period of enforced home detention.

4.4 Strengths

The sample size achieved in the current study was sufficient to detect the required power, alpha level and effect size that were specified in an a priori power analysis. A larger sample improves the precision of the study and makes it more likely for a study to detect meaningful

differences with a smaller margin for error (Biau, 2008). The tools used to measure depression and sense of parenting competence are taken from the Parenting Stress Index, which is a widely used, well validated instrument with peer reviewed internal consistency and external validity. The Parenting Stress Index has been demonstrated to be a valid and reliable measure of parenting stress, and valuable tool for identifying and measuring the sources of that stress, including depression and sense of parenting competence. Its success and usefulness after being translated into over 40 different languages and being applied in diverse cultures is supported in the literature.

4.5 Limitations

The findings of this study should be considered in the context of the following limitations. The subscales of the Parenting Stress Index (Abidin, 2012) that were used to assess depression and sense of parenting competence are self report measures, and while participants were reassured on a number of occasions that their responses were anonymous in order to ensure accurate responses, those responses were not validated objectively with clinical assessment. The fact that the participants self reported both their own and their partner's mental health may increase the possibility of bias in the study. The study design was a cross sectional study, so any analysis of causation was not possible. For example, sense of parenting competence in not a stable construct and the direction of causation between it and depression is not clear. To fully understand the risk factors and the course of paternal post-natal depression, a longitudinal study may be more effective.

Fathers of children who identify as Aboriginal or Torres Strait Islander are over-represented in this study, and respondents had completed on average a higher level of education

compared to the Australian population as a whole. The ability to raise $2000 in an emergency was used as a proxy for socioeconomic status, and this suggested that the sample had a higher socioeconomic status than the general population. This may limit the generalisation of the research.

The fact that the study took place during a global pandemic should also be considered. As discussed above, the pandemic elevated depression levels in the community, and forced lockdowns meant participants in this study were potentially working from home and around their young children even when not on leave, which could have given rise to results that would not be replicated had the study been conducted when the restrictions on movement were not in place.

4.6 Implications

The results of the current study highlight the importance of a greater understanding of the factors contributing to paternal post-natal depression. The higher than expected mean self reported depression score was consistent with the few studies to date that have examined the impact of the Covid-19 pandemic on mothers post-natal mental health, and suggest that the stress, uncertainly and isolation that is part of living through a health crisis with a young child is having an understandable impact on the mental health of new parents. Given our understanding of the impact a fathers' mental health can have on his partner and family's well-being, this is a cause for some considerable concern.

Future study may examine the factors that contribute to the higher levels of post-natal depression in parents during a period of crisis, and how those crises may affect new parents differently to the general population. Such investigation may provide for the development of

interventions to be made available as part of a public health response to future public health emergencies.

The higher than expected mean score for the sense of parenting competence subscale of the parenting stress index raises questions about the nature of causation in the relationship between parenting competence and post-natal depression. As described above, a number of studies have identified a relationship between a father's sense of parenting competence and post-natal depression, but none to date have sought to understand the direction of causation. Such an understanding would provide foundational knowledge to inform intervention development, either focussing on competence training to reduce the incidence or severity of depression, or to allow focus to brought to factors known to contribute to the condition.

4.7 Conclusion

While this study was able to replicate the results tabled in previous research demonstrating an association between sense of parenting competence and post-natal depression in fathers, no association was found between leave taking behaviour and depression, or leave taking behaviour and sense of parenting competence. The lack of association between leave taking behaviour and the other two variables is not consistent with the findings of previous research. The study examined leave taking behaviour and mental health of fathers in the two years leading up to June 2021, a period of time that included a series of hard lockdowns in all of Australia's major cities, enormous employment uncertainty and existential fear brought about by a fast spreading deadly virus. It seems likely that the threshold of 3 weeks of leave to enable attitudinal and behavioural change in fathers became meaningless over this period, as many fathers spent more than three weeks at home full time due to the imposed restrictions on movement. It would be worthwhile repeating this study at a later date when the pandemic

has passed to test the hypotheses in more normal conditions. It would also contribute to the knowledge of paternal post-natal depression if a study were to test the causal nature of the relationship between sense of parenting competence and depression, as it may have been reasonable to expect an improvement in sense of parenting competence due to the additional time fathers spent at home during the pandemic, and yet the mean score on that scale was higher than the normative data suggested should be the case. It is hoped that further investigation in these areas would allow targeted interventions to encourage leave taking or improve sense of parenting competence to reduce the frequency and impact of paternal post-natal depression.

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