ATTACHMENT RG 7

This is the attachment marked “**RG 7**” referred to in the witness statement of Rebecca Giallo dated 7th July2015.

Psychosocial risk factors associated with fathers' mental health in the postnatal period: results from a population-based study

Rebecca Giallo, Fabrizio D'Esposito, Amanda Cooklin, Fiona Mensah, Nina Lucas, Catherine Wade & Jan M. Nicholson

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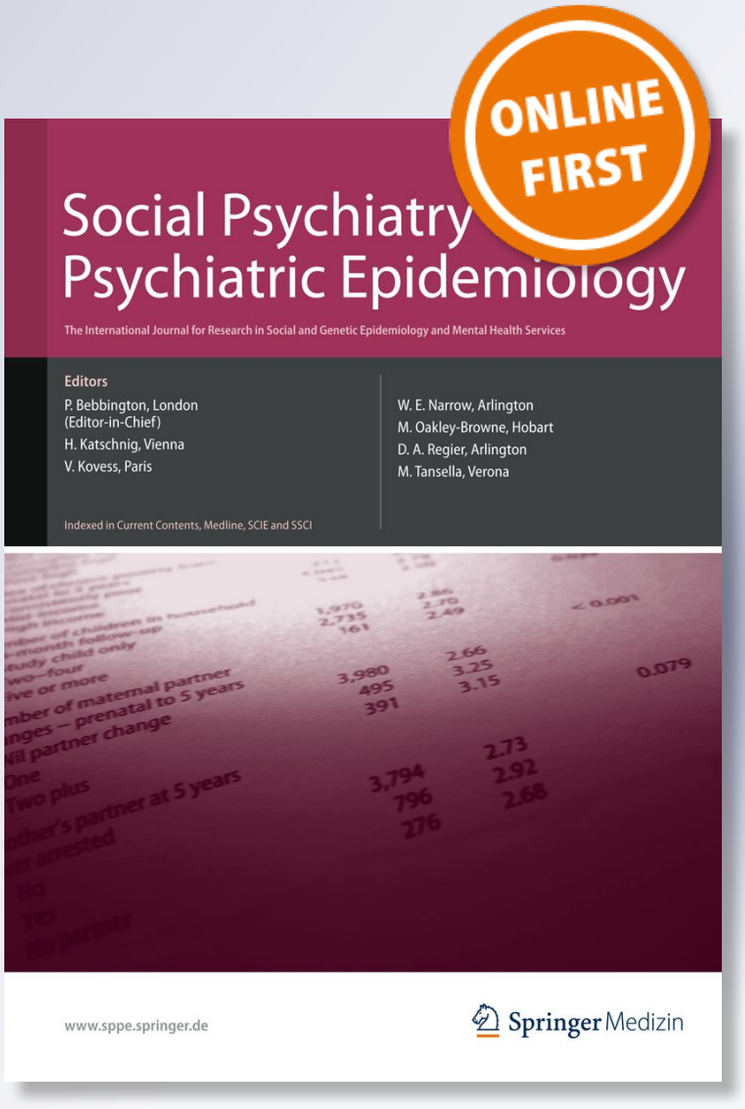

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ORIGINAL PAPER

Psychosocial risk factors associated with fathers' mental health in the postnatal period: results from a population-based study

Rebecca Giallo · Fabrizio D'Esposito · Amanda Cooklin · Fiona Mensah · Nina Lucas · Catherine Wade · Jan M. Nicholson

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Abstract
Purpose Fathers' psychological distress in the postnatal period can have adverse effects on their children's well-being and development, yet little is known about the factors associated with fathers' distress. This paper examines a broad range of socio-demographic, individual, infant and contextual factors to identify those associated with fathers' psychological distress in the first year postpartum.
Methods Secondary analysis of data from 3,219 fathers participating in the infant cohort of the Longitudinal Study of Australian Children at wave 1 when children were 0–12 months of age.
Results Approximately 10 % of fathers reported elevated symptoms of psychological distress. Logistic regression analyses revealed that the risk factors were poor job quality, poor relationship quality, maternal psychological distress, having a partner in a more prestigious occupation and low parental self-efficacy.
Conclusion These findings provide new information to guide the assessment of fathers' risk for psychological distress in postnatal period. There are also important social policy implications related to workplace entitlements and the provision of services for fathers.

Keywords Fathers · Postnatal · Mental health · Distress

R. Giallo (✉) · F. D'Esposito · A. Cooklin · N. Lucas · C. Wade · J. M. Nicholson
Parenting Research Centre, Level 5, 232 Victoria Parade, East Melbourne, VIC 3002, Australia
e-mail: rgiallo@parentingrc.org.au

R. Giallo
School of Health Sciences, RMIT University, Melbourne, Australia

F. D'Esposito · F. Mensah · N. Lucas · J. M. Nicholson
Murdoch Childrens Research Institute, Melbourne, Australia

F. Mensah
Department of Pediatrics, The University of Melbourne, Melbourne, Australia

F. Mensah
Clinical Epidemiology and Biostatistics Unit, Royal Children's Hospital, Melbourne, Australia

Introduction

The first year after having a baby is a period when some fathers are at risk of significant psychological distress. In the postnatal period, approximately 10 % of fathers experience depression [1] and 10–17 % experience anxiety [2, 3]. While there is evidence that paternal postnatal depression can contribute directly to children's social, emotional and cognitive problems in both the short and long term [4–6], few studies have examined the factors associated with fathers' psychological difficulties at this time. Using a large national sample of fathers participating in Growing Up in Australia: The Longitudinal Study of Australian Children (LSAC), we investigated a broad range of individual, infant and contextual factors to identify those associated with psychological distress in fathers during the first postnatal year.

Socio-ecological theories highlight that the complex interplay of biological, individual and contextual factors likely contributes to mental health difficulties [7]. For mothers, a past history of mental health problems, low social support, poor marital relationship, recent stressful life events, lower socio-economic position and poor health of the baby have been identified as the key risk factors for

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postnatal depression [8–10]. In contrast, research with fathers has been limited, largely lacking underpinning theoretical frameworks, and generally failing to consider a broad range of potential risk factors.

In terms of individual characteristics, younger fathers, those who are younger at the time of first fatherhood, and those with a past history of mental health difficulties appear to be more likely to experience postnatal depression [6, 8, 11]. This early period of fatherhood may be particularly challenging as fathers adjust to the significant changes brought about by having a baby, learn new parenting skills, and grow in confidence in caring for their baby.

Fathers' confidence in their parenting ability, referred to as parental self-efficacy (PSE), may contribute to their postnatal mental health. In mothers, low PSE has been associated with maternal depression, punitive discipline and reduced sensitivity to infant cues and needs [12, 13]. The association between psychological distress and father's parenting self-efficacy has received little attention, with past studies employing small sample sizes and finding mixed results. For example, some studies have reported no relationship between PSE and depressed mood in fathers of infants [14] and toddlers [15], while others have found high PSE to be associated with lower depression scores for fathers of toddlers [16].

With respect to infant factors, fathers' perceptions of their baby and challenging behaviours appear to be important. Fathers who perceived their infant as being an 'easy' baby are more likely than other fathers to have good mental health [17], while infant settling difficulties and crying are associated with higher depressive symptoms [18]. Notably, infant settling and crying problems tend to peak at 3–6 months of age [19], a time that corresponds with an elevation in rates of paternal depression compared to earlier in the postpartum [1]. The association between other infant characteristics such as prematurity or low birth weight and fathers' mental health remains unexplored.

The contextual factors most commonly associated with fathers' mental health are maternal depression and relationships difficulties. Several meta-analyses have reported moderate to strong relationships between mothers' and fathers' postnatal depressive symptoms [1, 20]. The association is likely to be bidirectional, with one parent's depressed mood, negative cognitions, and limited coping, placing significant burden on the partner and increasing the partner's risk of depression [21]. Partner depression is also associated with relationship difficulties including poorer couple communication and more negative interactions [22]. An unsupportive couple relationship and relationship dissatisfaction are associated with higher levels of fathers' depression generally [18], including during the early postpartum period [2]. Adverse contextual factors such as life stress, lack of social support, and financial strain are also likely to place parents at risk of mental health difficulties, and have been found to be risk factors for mothers in the postpartum [8–10]. To date, few studies have examined these factors in relation to fathers' mental health.

Another area that has received surprisingly little attention concerns fathers' employment characteristics and conditions. Employment conditions have long been shown to impact on the mental health and wellbeing of employees [23, 24]. More recently, it has been shown that the mental health of mothers in the postpartum is positively associated with access to work conditions that are supportive of family commitments such as control over workload and working hours, job security and access to paid family-related leave [25].

The respective work roles of mothers and fathers may also be influential. Over the last four decades, there have been enormous changes in the roles of fathers and mothers with respect to work and family. The increased participation of women in higher education and the paid workforce has resulted in more women being in high status, well-paid jobs than previously. Economic pressures have meant that many young families rely on two incomes. The proportion of Australian working mothers of children under 15 years of age has increased from less than 50 % in 1987 to nearly 60 % in 2006 [26], and nearly half (44 %) of all Australian mothers resume employment in the first year after their child's birth [27]. These changes have resulted in a decline in the traditional male-breadwinner family, potentially introducing role ambiguities around the unique contributions of fathers to their households.

Australian mothers' early resumption of employment, relative to women in comparable industrialised settings [28, 29], means that families have to negotiate the demands of dual employment roles, unpaid labour and childcare responsibilities in the early months following the birth of an infant. This potentially has adverse consequences for the quality of the couple relationships, for family functioning, and for experiencing role overload [30, 31], with each of these inextricably linked to mental health. Furthermore, the potential for couples' relative job status to impact on men's mental health has been illustrated by Rogers and colleagues [32]. Their study of 1,047 couples at various life stages found that men's happiness in the couple relationship (a common predictor of depression) decreased as their partners' contribution to household income increased. The impact of father's job quality and occupational status relative to his partner has not been examined as potential predictors of mental health in the postpartum.

In summary, relatively little is known about the factors that impact on fathers' mental health in the postpartum. With few exceptions [6], previous studies have recruited small samples, typically from clinical settings such as hospital-based mother–baby units [18]. While these

provide important information about clinical samples, their findings may not generalise to fathers in the broader population. Additionally, research to date has primarily focused on depression. Men tend to underreport depressive symptoms and may experience psychological distress in different ways than those assessed on self-report measures of depression [33]. It has therefore been recommended that assessment should use general mental health measures that include symptoms of stress and anxiety in addition to depression [34].

The aim of the current study was to explore a broad range of individual, infant and contextual factors associated with psychological distress in the first year postpartum in a large cohort of fathers. These included several previously neglected potential influences, including fathers' parenting self-efficacy, relationship satisfaction, job quality and relative occupational prestige. Additionally, we measured psychological distress using a general screening tool that assesses symptoms of depression, anxiety and stress.

Methods

Study design and sample

Data were collected in the first wave of the nationally representative LSAC infant cohort. Study design and sample information are detailed elsewhere [35]. Briefly, a two-stage clustered sample design was used: first approximately 10 % of all Australian postcodes were selected (stratified by state of residence and urban vs. rural status); then a number of children proportional to population size was randomly selected from each postcode using the Medicare database, a universal health insurance scheme that includes >90 % of Australian infants. The infant cohort consisted of 5,107 infants, aged 3–19 months at the time of wave 1 data collection. The LSAC cohort was broadly representative of the Australian population, with slight over-representation of families with more highly educated parents, and under-representation of single-parents, non-English speaking families and families living in rental properties. The sample for the current analysis is biological fathers who resided with their infant child aged 12 months or younger at the time of the wave 1 data collection, and for whom self-report mental health data were available ($n = 3{,}219$).

Measures

LSAC data were collected during face-to-face interviews with fathers and mothers who were the primary carers of the study children, as well as through self-complete questionnaires which were filled out both by primary and secondary carers. Finally, some broader socio-economic and geographical indicators were obtained using data from the Australian Bureau of Statistics.

Mental health

Fathers' mental health was measured using the Kessler-6 (K6) scale [36]. This screening tool provides a global measure of psychological distress in the last 4 weeks. Using a self-complete questionnaire, respondents indicated (using a five-point scale) how often they felt nervous, hopeless, restless or fidgety, extremely sad, worthless and that everything was an effort. Items were summed (range 0–24), with higher scores indicating greater psychological distress. The K6 is often used due to its brevity and strong psychometric properties. The symptomatic range (likely psychological distress) was defined by scores of 8–12, and the clinical range (significant psychological distress) as scores of 13–24.

Potential risk and protective factors

A wide range of factors likely to be associated with fathers' mental health were examined as summarised in Table 1. These could be classified as socio-demographic, father, infant and contextual (family, employment) characteristics. As summarised in the table, LSAC employed standardised measures from national studies such as the Australian Census where possible (e.g. socio-demographic measures). Table 1 also details the tools used for the collection of data in LSAC. Two derived variables relating to employment were included, as described below.

Job quality

Job quality was measured using the Job Quality Index (JQI) developed for LSAC [37]. The JQI at wave 1 consists of access to four work condition variables: paid family friendly leave, flexible hours, job control and job security. Overall scores were a simple count of the number of conditions available to the parent, ranging from 0 for no quality conditions available to 4 for all four conditions available.

Occupational prestige differential

Occupational prestige was assessed for fathers and their partners using the 4th release of the Australian National University Status Scale [38]. This ranks occupations by skill level and occupation type, taking into account the indirect effect of education and income, and the social perception of the status and prestige associated with occupations. For couples where both parents were

Table 1 Socio-demographic, father, contextual and infant characteristics

Construct	Ref	Additional information
Socio-demographic characteristics		
Age[a]	n/a	Age at last birthday (years)
Country of birth[a]	n/n	Australia/NZ = 0; other = 1
Indigenous status[a]	n/a	Aboriginal or Torres Strait Islander. No = 0; yes = 1
Language[a]	n/a	Main language spoken at home. English = 0; not English = 1
Education level[a]	n/a	Completed year 12 or equivalent. Yes = 0; no = 1
Income[a]	n/a	Personal weekly income (AUD)
Financial hardship[a]	[48]	Eight items assessing whether family went without meals, was unable to heat/cool home, etc. in last 12 months. No hardship = 1; some hardship = 2; significant hardship = 3
Neighbourhood disadvantage (SEIFA)[b]	[49]	Index of Relative Disadvantage score by home postal code. Divided into quintiles. First quintile = least disadvantaged
Remoteness (ARIA)[b]	[50]	Remoteness index based on accessibility to services. Highly accessible/accessible = 0; else = 1
Father characteristics		
Parental self-efficacy[c]	[51]	Four items. Attitudes and beliefs about one's competence as a parent. Higher scores indicate higher self-efficacy. Highest 80 % of distribution = 0; lowest 20 % (low self-efficacy) = 1
Other children[d]	n/a	Other biological children. Yes = 0; no = 1
Infant characteristics		
Gender[a]	n/a	Female = 0; male = 1
Age[a]	n/a	Age in months
Conception method[a]	n/a	Assisted reproductive technology. No = 0; yes = 1
Prematurity and low birth weight[a]	[52]	Premature (<37 weeks of gestation) and/or low birth weight (<2,500 g). No = 0; yes = 1
Temperament[e]	[53]	6 items assessing the infant's reactions to new situations and people, responsiveness to soothing attempts and ability to engage in sustained solo play. Higher scores reflect high sociability and high cooperation. Highest 80 % of distribution = 0; lowest 20 % (low sociability; low cooperation) = 1
Irritability[e]	[53]	Four items assess the infant's propensity to fret and/or cry when waking up/going to sleep and when left alone even if being soothed. Higher scores reflect higher irritability. Lowest 80 % of distribution = 0; highest 20 % (high irritability) = 1
Sleep problems[a]	[54]	Two or more sleep problems, four or more nights per week (P). Difficulty getting to sleep; not happy sleeping alone; waking during the night and; restless sleep. No = 0; yes to any two = 1
Sleep patterns[a]	[54]	Infant's sleep patterns a problem. No = 0; yes = 1
Contextual characteristics		
Employment status[a]	n/a	Work hours. Part-time (1–34 h/week) = 0; full-time (35–44 h/week) = 1; long full-time (45+ h/week) = 3
Job quality[d]	[24]	Four items assessing access to paid parental leave, flexible hours, job control, job security. Higher scores indicate higher quality
Occupational prestige[f]	[38]	Prestige based on education, income, and social perceptions associated with main occupation. Professional skilled = 1; labour and clerical = 2; unskilled labour = 3
Occupational prestige differential[f]	n/a	Fathers' occupational prestige score subtracted from that of their partner, recoded to +1 to +5. 1 = "Greatest disparity in favour of father" 3 = "Equal occupational prestige", and 5 = "Greatest disparity in favour of mother". Additional categories: 6 "At least one parent unemployed", and 7 "Father employed, mother not in the labour force"
Mother's mental health (K6)[g]	[36]	Six items measuring symptoms of anxiety or depression in the last 4 weeks. Higher scores indicate more distress. No distress = 0; symptomatic or clinical distress (score >7) = 1

Table 1 continued

Construct	Ref	Additional information
Relationship quality[d]	[55]	Single item assessing degree of happiness in relationship. Happy/very happy = 0; other = 1
Stressful life events[e]	[56]	Family grief/illness events. Eighteen items assessing whether a family member or close friend died or suffered a serious injury, illness or assault. No events = 0; one or more events = 1

[a] Data collected mostly from mothers (98 %) in face-to-face interviews

[b] Australian Bureau of Statistics data

[c] Data collected from fathers in self-complete questionnaires

[d] Data collected from fathers in face-to-face interviews and self-complete questionnaires

[e] Data collected mostly from mothers (98 %) in self-complete questionnaires

[f] Derived

[g] Data collected from mothers in self-complete questionnaires

employed at the time of data collection, fathers' and their partners' occupational prestige scores were each collapsed to: 1 = "Unskilled labour", 2 = "Labour and clerical", and 3 = "Professional/skilled". An 'occupational prestige differential' was computed by subtracting the occupational prestige scores of fathers from that of their partner. The resulting differential scores (range from −2 to 2) were then recoded to a 1–5 scale where 1 = 'Greatest disparity in favour of father' 3 = 'Equal occupational prestige', and 5 = 'Greatest disparity in favour of mother'. Two additional categories were created for couples where one or both parents was unemployed and for those where the father was employed and the mother was not in the labour force.

Statistical analysis

Logistic regression was performed to investigate the associations between the potential risk factors and fathers' mental health. To select variables for inclusion in a final multivariable model, each factor was examined in a series of bivariate logistic regressions. Variables associated with fathers' mental health at $p < 0.1$ in the bivariate models were included as covariates in the final multivariable model. A confirmatory stepwise backwards logistic regression analysis with all potential risk factors was also performed, with the threshold for inclusion in the final model set at $p < 0.05$. Results are presented as odd ratios with 95 % confidence intervals.

Variance inflation factors (VIFs) were determined to identify potential collinearity problems between symptoms of psychological distress and measures that were found significant at $p < 0.001$ in the bivariate logistic regression. While VIF scores greater than 10 are often regarded as indicative of collinearity, scores approaching this value should also be reviewed [39]. This check resulted in two measures (fathers' and mothers' general health) being removed from the analyses due to their high associations with fathers' and mothers' mental health (VIF = 8.54 and 7.82, respectively).

The prevalence of mental health difficulties and logistic regression analyses were weighted for non-response and to account for unequal probabilities of selection into the sample. First-order Taylor linearisation was used to obtain estimates of standard error taking account of the multi-stage, clustered sampling design. Analyses were conducted using Stata 11.0.

Results

Sample characteristics

For this analysis, the sample population was biological fathers residing with infants aged 12 months or younger. Of the total cohort at wave 1 ($n = 5{,}107$), 90 % ($n = 4{,}602$) were biological fathers. Of these 92 % ($n = 4{,}251$) had an infant aged 12 months or younger at the time of data collection, 76 % ($n = 3{,}219$) of whom had mental health data (total K6 score) available. The proportion of fathers excluded due to missing mental health data can be largely accounted for by the questionnaire response rates: overall approximately 80 % of fathers completed study questionnaires containing mental health questions [40].

Comparisons of included fathers with those excluded revealed some substantial socio-demographic differences. A greater proportion of included fathers (by around 10–13 %) had completed year 12 of high school, spoke English at home and had high prestige jobs. On average, they also had higher incomes and lower socio-economic disadvantage than excluded fathers ($p < 0.001$) (data available upon request).

Fifty fathers in the study sample (1.6 %) were identified as the primary carers of the study child ('stay-at-home dads'). With the exception of work hours and income, no differences were observed between these fathers and the remainder of the sample on socio-demographic characteristics and mental health. Therefore, the data for primary caring and other fathers were combined.

Socio-demographic, employment and mental health characteristics of the study sample are presented in Table 2. With the exception of income data which was missing for 13 % of fathers, there was less than 6 % missing data across all variables. The majority of fathers completed year 12 and above (61 %) and spoke English at home (89 %), and only a small proportion (1.5 %) identified as Indigenous. Most worked full-time or long full-time hours (88 %), and reported having at least three of the four favourable job conditions investigated (76 %). Only 5.7 % reported one or no favourable conditions in their job. Of the employed fathers whose partner was also employed, 81 % had equal or higher occupational prestige than their partners. Ten percent of fathers reported psychological distress: 8 % in the symptomatic range and 2 % in the clinical range.

Table 2 Socio-demographic and mental health data for fathers ($n = 3{,}219$)

Measure	Proportion (%)
Age at last birthday[a]	33.9 (5.8)
Aboriginal or Torres Strait Islander	1.5
Language other than English at home	10.9
Education level—year 12 and above	60.8
SEIFA	
Least disadvantaged	20.9
2nd quintile	24.6
3rd quintile	21.5
4th quintile	13.1
Most disadvantaged	19.9
Employment status	
Unemployed	2.3
Not in the labour force	3.3
Work part-time (1–34 h/week)	6.5
Work full-time (35–44 h/week)	37.7
Work long full-time (45+ h/week)	50.3
Weekly income from all sources[a, b]	1,018.5 (741.3) AUD
Job quality—favourable work conditions	
None/one	5.7
Two	18.1
Three	43.7
Four	31.9
Occupational prestige differential	
Greatest disparity in favour of fathers	1.9
Disparity in favour of fathers	10.1
Equal	24.9
Disparity in favour of mothers	7.7
Greatest disparity in favour of mothers	1.2
At least one parent unemployed	6.2
Dad employed and mum not in the labour force	48.2
Age of child in months[a]	8.4 (2.2)
Psychological distress[a]	
Symptomatic range (K6 score 8–12)	9.7 (1.5)
Clinical range (K6 score 13–24)	16.6 (3.2)
K6 score	3.3 (3.3)

[a] Mean (SD)

[b] $n = 2{,}823$

Logistic regression analyses

Bivariate analysis

Several socio-demographic (i.e. country of birth, language spoken at home, education, income and significant financial hardship), father (i.e. self-efficacy), child (i.e. problematic sleep patterns, sleep problems and irritability) and contextual (i.e. maternal psychological distress, poor relationship quality, exposure to stressful life events, employment status, low job quality and lower occupational prestige compared to their partner) characteristics were significant predictors ($p < 0.05$) of fathers' distress in the bivariate analyses (OR ranging from 1.1 to 5.6). There was evidence for an association ($p < 0.1$) between fathers' distress and being Indigenous and/or experiencing some financial hardship (OR 1.1–2.0).

There was no evidence of an association between fathers' mental health and geographical remoteness, SEIFA score, individual occupational prestige, child gender, number of children living in the house, and whether fathers had children other than the study child. Likewise the infant characteristics of age, conception method, birth timing/weight and temperament were not associated with paternal distress.

Multivariable analysis

Measures showing a possible association with fathers' mental health were included in the multivariable model. Table 3 shows the measures included in the final model and the relevant unadjusted and adjusted odd ratios and 95 % confidence intervals for fathers experiencing psychological distress (symptomatic and clinical ranges combined). Father's psychological distress was associated with the father characteristic of low parental self-efficacy (OR 1.07; 95 % CI 1.03–1.12) and the contextual factors of having low relationship quality (OR 3.66; 95 % CI

Table 3 Predictors of symptoms of psychological distress in fathers

Variable	Symptoms of psychosocial distress (K6 score 8+)			
	Unadjusted[a]		Adjusted[a]	
	OR (95 % CI)	*p* value	OR (95 % CI)	*p* value
Socio-demographic and father characteristics				
Decreasing parenting self-efficacy	1.06 (1.03–1.08)	<0.001	1.03 (1.01–1.06)	0.006
Contextual factors				
Job quality—favourable work conditions[a]				
Three	1.60 (1.07–2.38)	0.022	1.75 (1.15–2.65)	0.009
Two	3.05 (2.03–4.58)	<0.001	2.51 (1.60–3.95)	<0.001
One/none	5.64 (3.21–9.93)	<0.001	5.20 (2.93–9.18)	<0.001
Occupational prestige differential[b]				
Greatest disparity in favour of fathers	0.66 (0.22–1.98)	0.461	0.76 (0.21–2.77)	0.679
Disparity in favour of fathers	1.01 (0.61–1.68)	0.959	0.90 (0.52–1.55)	0.699
Disparity in favour of mothers	1.10 (0.68–1.76)	0.701	0.93 (0.54–1.61)	0.796
Greatest disparity in favour of mothers	2.56 (1.15–5.68)	0.022	2.39 (1.02–5.59)	0.044
At least one parent unemployed	2.16 (1.28–3.66)	0.004	1.52 (0.65–3.58)	0.333
Father employed and mother not in the labour force	1.16 (0.86–1.56)	0.338	0.95 (0.66–1.38)	0.804
Not very happy with partner relationship	4.36 (3.32–5.72)	<0.001	3.66 (2.67–5.02)	<0.001
Increasing symptoms of psychosocial distress in mother	1.12 (1.09–1.16)	<0.001	1.07 (1.03–1.12)	0.001

[a] Compared with highest job quality (four favourable work conditions)

[b] Compared with equal occupational prestige

2.67–5.02), maternal psychological distress (OR 1.07; 95 % CI 1.03–1.12), low job quality (OR ranges from 1.75 to 5.20 with decreasing job quality; 95 % CI 1.15–9.18), and having a partner in a more prestigious occupation (OR 2.39; 95 % CI 1.02–5.59). Repeating the analysis using stepwise backwards logistic regression with all measures included replicated these findings, with the same variables and associations of similar strength emerging.

The association between occupational prestige differential and symptoms of psychological distress was investigated further. The multivariable analysis indicated that only fathers experiencing the greatest negative disparity between their own occupational prestige and that of their partners (i.e. partners had the highest occupational status) were significantly more likely to report symptoms of psychological distress than fathers in equal occupational prestige partnerships. Nonetheless, a trend was evident with the odds of experiencing psychological distress increasing as the occupational prestige disparity increased. That is, as mothers' occupational prestige increased relative to fathers, fathers' psychological distress increased. Fathers with high occupational prestige relative to their partners' were not at increased risk of psychological distress. A test for trend across ordered groups supported this finding. As shown in Fig. 1, fathers' mean K6 scores increased as the disparity in occupational prestige increased from a score of 2.4 for fathers with the highest occupational prestige relative to mothers compared to 3.7 for fathers with the lowest relative occupational prestige ($p = 0.044$).

Discussion

This study sought to address critical gaps in our knowledge about what may heighten fathers' risk of mental health problems in the postnatal period. In a larger, nationally representative sample of Australian fathers than has previously been available, we assessed a broad range of individual, infant and contextual factors associated with postnatal distress. Contextual factors pertaining to the couple relationship and fathers' employment were found to be the strongest predictors of distress, even after accounting for known risk factors for mental health difficulties such as father age, socioeconomic status, stressful life events, child temperament and sleep problems. These findings underscore the relative importance of contextual factors to fathers' mental health over and above socio-demographic and infant characteristics.

A particular strength and unique contribution of this study was the inclusion of employment factors such as job quality and occupational prestige, characteristics that have seldom been studied among fathers at this life stage. We

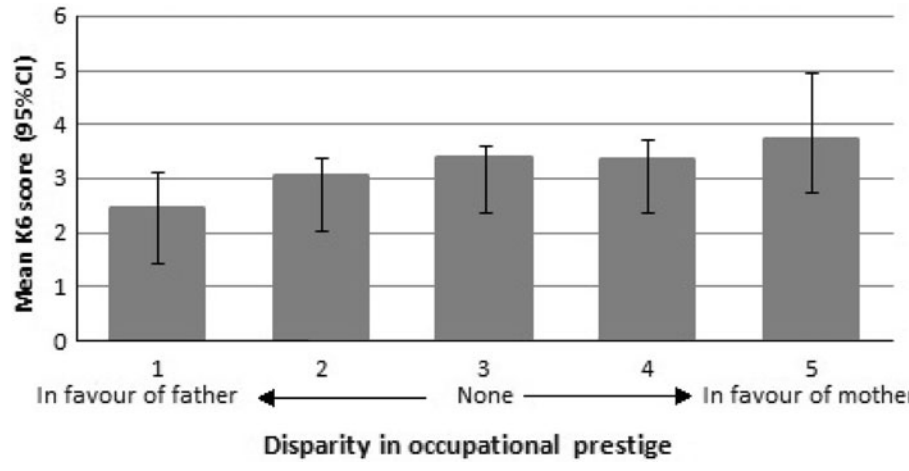

Fig. 1 Symptoms of psychological distress in fathers and occupational prestige differential

found that job quality was the factor most strongly associated with psychological distress, whereby fathers reporting the lowest job quality with access to the fewest favourable workplace conditions (i.e. control of workload and working hours, job security and access to paid family friendly leave) had five times the odds of reporting psychological distress than fathers with the highest job quality. While job quality has been associated with poor employee mental health in several previous studies [23–25], this is the first to our knowledge to demonstrate this relationship in fathers in the postpartum period. It is likely that fathers in low quality jobs are more likely to experience poorer job satisfaction, more job strain and more interference between paid work and family life, which may contribute to mental health difficulties at this time. Work–family conflict and strain are likely to be high in families with young children where both parents are employed [41, 42], as is the case for half of Australian families in the postpartum. Australian mothers resume employment soon in the postpartum, and this places an additional strain, overload and time pressure on families. Short, or inadequate parental leave policies do not convey to families the protection of one full-time parent able to attend to unpaid work and childcare for the postpartum period, and in other settings, this has potential risks for family functioning and child outcomes [43]. Poorer family functioning, higher family stress and increased couple conflict are also established outcomes of work–family conflict [44, 45], and all pose risk to mental health, as reported in this study.

Conversely, access to favourable workplace entitlements, such as flexible start and finishing times and paid family friendly leave, may provide fathers with adequate time to adjust to the increased demands associated with infant caregiving, allowing them to respond to the changing needs of their family. It may also enable fathers to be more available to provide emotional and practical support to their partner and to participate in early parenting. Not only is this important for father wellbeing, but for the wellbeing of the entire family.

This study also demonstrates the importance of the fathers' occupational prestige relative to their partners. We are not aware of any other research that has examined the association between partners' relative occupational prestige and fathers' psychological distress. Although the sample sizes were small for some groups, fathers whose occupational prestige score was considerably lower than their partner's had more than a twofold increased odds of psychological distress compared with those who had equal or higher prestige. In comparison to their partners, these fathers are likely to contribute significantly less to the overall household income, which may become an issue for fathers during the postnatal period when the pressure to financially provide for the family is often greater. The combination of poor job quality, markedly reduced family income and the failure to meet the prevailing gender role stereotype of being the primary 'breadwinner' may contribute to father distress at this time.

Couple relationship characteristics were also strongly associated with fathers' mental health. Fathers' dissatisfaction in the couple relationship was associated with a greater than threefold increased odds of distress. Wellbeing difficulties may contribute to dissatisfaction in the couple relationship, whereby the negative and depressed mood may influence negative appraisals of the couple relationship. It may also affect parents' ability to communicate effectively, and be responsive and sensitive to the needs of their partner and family, resulting in increased family stress and conflict in the couple relationship. It is also likely that changes in the couple relationship after having a baby may contribute to psychological distress at this time. Paulson [46] posits that relationship quality is highly sensitive to the marked changes in intimacy, communication, roles and responsibilities, shared values, work and the availability of support following the birth of a baby. This can lead to

dissatisfaction in the relationship, which may in turn contribute to depression in one or both parents. In the present study, a significant relationship between paternal and maternal psychological distress was found, although the strength of the association was modest (OR = 1.07). Taken together, these findings suggest that strengthening the couple relationship through the postnatal period is an important part of promoting father wellbeing.

A particularly noteworthy finding of this study relates to the infant characteristics and fathers' confidence in their parenting role. Consistent with previous research, a significant bivariate relationship between fathers' distress, child irritability and sleep and settling issues was found. However, the unique contribution of these infant characteristics was no longer significant when accounting for all other socio-demographic and contextual factors. Interestingly though, low parenting self-efficacy was associated with a significant but modest increased odds for psychological distress in fathers (OR = 1.03). These findings do suggest that the direct relationship between infant characteristics and fathers' mental health may be mediated by parental self-efficacy. That is, parenting challenges such as managing children's sleep and settling issues have the potential to undermine perceptions of competence in their parenting role which may in turn affect their mental health. Negative mood and cognitions associated with psychological distress may also influence negative attributions about parenting. This finding is important as low PSE has been associated with coercive discipline or hostile parenting, and a tendency to give up easily when faced with difficult parenting challenges [13], behaviours likely to contribute to behavioural difficulties in children.

Finally, it is important to note that the unique contributions of known socio-demographic risk factors associated with fathers', and men's mental health in general, such as father age, education, income, financial hardship, living in a rural or remote location and neighbourhood disadvantage, were no longer significant in the multivariable analysis. These findings underscore the relative importance of contextual factors pertaining to employment and the couple relationship to fathers' postnatal mental health, over and above structural socio-demographic and infant characteristics.

Limitations

There are several limitations to this study. First, a past history of mental health difficulties is a known risk factor for postnatal distress, but was not assessed for non-primary caregivers in LSAC, who were mostly fathers. Second, the study findings are based on fathers in couple relationships, and may not generalise to single fathers who are primary caregivers or fathers not living with their children. For instance, we have found that non-resident fathers have higher rates of distress during the early parenting years than fathers living with their children [47], and it is possible single or non-resident fathers may experience additional or different risk factors from those in couple relationships. These may include, for example, the degree of parental conflict experienced during and following separation, and the amount and type of contact with children. Third, fathers who identify as Aboriginal and/or Torres Strait Islander are under-represented in LSAC, and fathers who were missing self-report mental health data were more socially disadvantaged than fathers included in this study. These groups may be at greater risk of psychological distress, and therefore there is a possibility that the study findings underestimate associations between the investigated factors and paternal mental health in the general population. It should also be noted that approximately half of the fathers in this study had a partner not currently in the labour force ('stay-at-home mums'), limiting the number of individuals for whom an occupational prestige differential was able to be calculated. Accordingly the number of fathers who reported mental health difficulties, and who were from a disadvantaged background (e.g. unemployed), identified as Indigenous Australian, and had occupational prestige differential data was limited; the relative estimates should thus be interpreted with some caution. Lastly, the current study is based on cross-sectional data, and causality cannot be inferred. It is likely that bidirectional and complex interrelationships exist among fathers' mental health difficulties and identified risk factors.

Implications and conclusions

Despite its limitations, the current study extends previous research by exploring a broad range of factors associated with psychological distress in a large sample of Australian fathers from a socio-ecological framework. It highlights the relative importance of contextual factors to father mental health compared with individual and infant-related factors, and provides a platform for further research. For instance, research is needed to identify risk and protective factors for fathers living in sole-parent families or not currently living with their children. This will provide important information about the particular needs of some fathers and how they can be best supported.

Further investigation into how more specific aspects of job quality, employment conditions and entitlements, such as access to parental leave and flexible working hours, may contribute to father's mental health during the postnatal period is also needed. Mothers' and fathers' participation in paid employment per se does not contribute to parental mental health difficulties. However, family leave entitlements,

access to quality childcare, and the negotiation of paid and unpaid labour within couple families are likely to influence mental health. Understanding these pathways and mechanisms will provide a more in-depth understanding of the full impact of employment on fathers' mental health. Given that fathers in Australia are generally not afforded the same parental leave conditions as mothers, further research is required to understand the relative effect of both fathers and mothers employment conditions on family functioning and parent mental health. The findings pertaining to the relationship between occupational prestige differences within the couple and fathers' mental health also need to be confirmed in a larger cohort of fathers.

From a clinical practice perspective, these findings may assist health professionals in identifying fathers at risk of mental health difficulties. Clinical assessment of fathers' mental health should consider risk factors such as employment and job quality, quality of the couple relationship, early parenting experiences, confidence in their parenting role and perceptions regarding their relative contributions to the family. These are also potential targets for intervention and support to improve father wellbeing during the early parenting period. For instance, fathers may particularly benefit from information and support pertaining to managing work-related pressures, negotiating work–life balance and coping with changes in the couple relationship.

Finally, on a broader level, the current study has important implications for social policy pertaining to workplace entitlements for fathers in the postnatal period. Improving fathers' access to high quality employment conditions and entitlements such as paid leave and flexible working arrangements during this time has the potential to improve the mental health outcomes not only for fathers, but for mothers and their children.

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