ATTACHMENT RG 2

This is the attachment marked "**RG 2**" referred to in the witness statement of Rebecca Giallo dated 7th July 2015.

Father mental health during the early parenting period: results of an Australian population based longitudinal study

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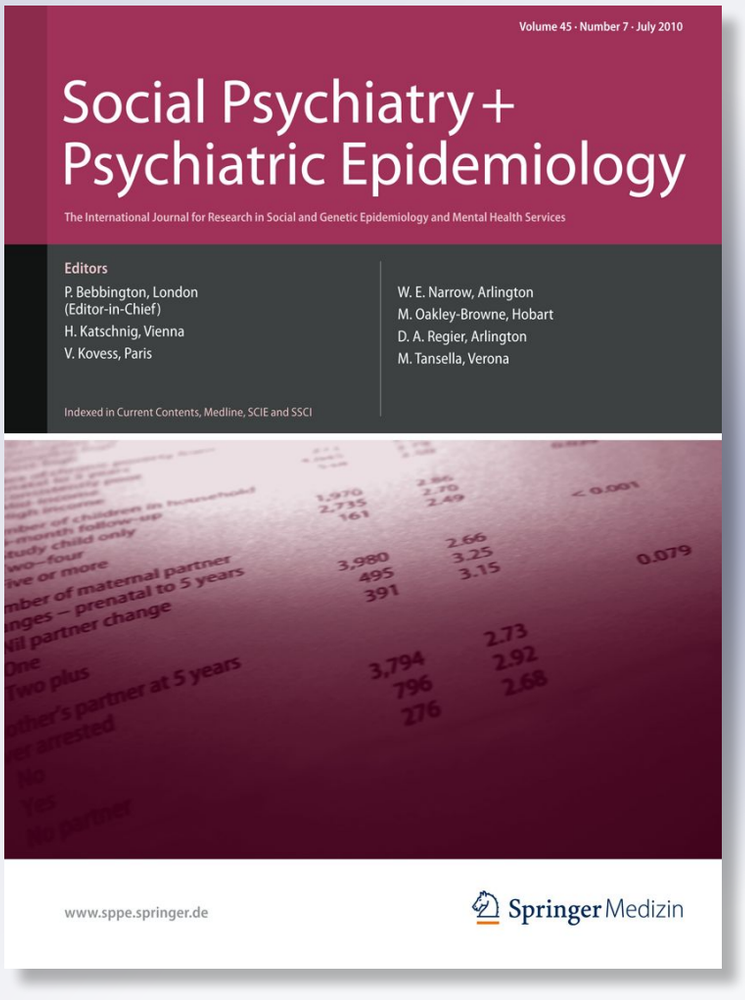

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ORIGINAL PAPER

Father mental health during the early parenting period: results of an Australian population based longitudinal study

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Abstract
Purpose The primary objective of this study was to report on the occurrence of mental health difficulties for a large national sample of Australian fathers of children aged 0–5 years ($n = 3{,}471$). Secondary objectives were to compare fathers' mental health against normative data for the general male adult population, and to examine the course of mental health problems for fathers across the early childhood period.
Methods Secondary analysis of data from the infant cohort of the Longitudinal Study of Australian Children at three waves when children were 0–12 months, 2–3 and 4–5 years. Comparative data on the prevalence of psychological distress in the Australian adult male population sourced from the National Survey of Mental Health and Wellbeing.
Results Approximately nine per cent of fathers reported symptomatic or clinical psychological distress at each wave, as measured by the Kessler-6. Approximately 30 % reporting distress at wave 1 continued to report distress at a similar or worse level across waves 2 and 3. Fathers not living with their children also had high rates of distress (14 % at wave 1 and 10 % at wave 2). Finally, fathers in the present study had 1.38 increased odds (95 % CI 1.12–1.69) for psychological distress compared with the Australian adult male population.
Conclusions Fathers are at risk of experiencing postnatal mental health difficulties, which may persist across the early childhood period for some fathers. The results suggest routine assessment of fathers' wellbeing should be undertaken in the postnatal period with mental health interventions and support provided across the early childhood period.

Keywords Fathers · Postnatal · Distress · Depression

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Introduction

Fathers' mental health across the early parenting years has been associated with their children's development and wellbeing [1–6]. Yet our understanding of fathers' mental health during this period is limited. Estimates of the prevalence of mental health problems in the first year following the birth of a child vary considerably; for depression they range from 1 to 25 % [5, 7, 8], with a recent meta-analysis of 43 studies reporting a meta-estimate of 10.4 % [9]. For anxiety disorders, estimates range from 10 to 17 % [10–12]. It is not clear whether these rates differ

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from those for men in the general adult male population, and little is known about how they vary within the population and over time. To identify when and with whom early interventions may be required, the following questions need to be addressed: What is the prevalence of mental health problems in fathers of young children? Does this differ from the prevalence of mental health problems for men generally? Does the prevalence vary by family living arrangements? What is the persistence of these problems over time? The current study addresses these questions using data from a large national sample of Australian fathers participating in the Longitudinal Study of Australian Children (LSAC) at three time points from 0 to 5 years after the birth of a child.

There is some evidence from Australian studies that fathers' psychological distress increases across the first year postpartum [13, 14]. One study found the proportion of fathers in the clinical range on the Edinburgh Postnatal Depression Scale (EPDS) increased from 2.8 % at 6 weeks postpartum to 3.2 % at 12 weeks, and 4.7 % at 12 months [13]. A similar trend with slightly lower rates was documented in another study which found that 1.9 % of fathers scored in the clinical range on the EPDS at 3 months, increasing to 2.1 % at 6 months and 2.3 % at 12 months postpartum [14].

While these studies provide important information about fathers' mental health during this first year, little is known about the progression of mental health difficulties beyond the postnatal period. In particular, it is unknown what proportion of fathers go on to have sustained, and potentially more serious, mental health difficulties beyond the early postnatal period.

The mental health of fathers who are not living with their children is an especially neglected area. Results from the few studies in this field show that fathers living apart from their children report more social and psychological difficulties than other fathers [15–17]. For instance, in a New Zealand study of 498 fathers in their mid 20 s, those living only some or none of the time with their children reported a lower threshold for negative emotions such as fear and anger, more anxiety symptoms++, and greater alcohol or marijuana use than fathers living full-time with their children [16]. In a more recent North American study of 2,716 fathers of infants, the highest rates of depression were reported by fathers not living with their children [17]. Twenty per cent of separated or divorced fathers and 12 % of those who were romantically involved but not living with the child's mother were depressed compared with 7–9 % of those in married or cohabiting relationships. Thus, studies that only examine fathers living in married and cohabiting relationships may substantially underestimate the true prevalence of mental health difficulties in the broader population of fathers.

Another important consideration is the selection of assessment tools used to measure fathers' mental health. It has been argued that men tend to under-report symptoms when assessed by diagnostic interviews or self-report measures specifically targeting depression [18, 19]. Australian studies have shown that general measures of psychological distress (e.g. the General Health Questionnaire) yield higher reports of difficulties by fathers than specific symptom measures of depression (i.e. EPDS, Beck Depression Inventory) [14, 20]. Thus, it has been argued that general symptom measures of stress, anxiety and depression may provide a more accurate picture of fathers' mental health than depression-specific measures [13].

The primary aim of the current study was to identify the occurrence of mental health difficulties for a large sample of fathers participating in the LSAC across three time points when their children were aged 0–1, 2–3 and 4–5 years. Fathers' mental health is assessed using the Kessler-6 scale, a general measure of psychological functioning that measures depressive, anxiety and stress symptoms. The study reports on the mental health of fathers who live with their child and those who live elsewhere and compares the mental health of fathers in the current study against normative data for the general male adult population using the 2007 Australian National Survey of Mental Health and Wellbeing (NSMHWB) [21]. Finally, it examines the course of fathers' mental health problems across the postnatal and early childhood period.

Methods

Study design and sample

This paper uses data from waves 1 (2004), 2 (2006), and 3 (2008) of the nationally representative LSAC infant cohort. Study design and sample information are detailed elsewhere [22]. LSAC employed a two-stage clustered sample design. Approximately 10 % of all Australian postcodes were selected (stratified by state of residence and urban vs. rural status). A sample of children proportional to population size was then randomly selected from each postcode using the Medicare database, which includes over 90 % of all Australian infants. The infant cohort consisted of 5,107 children aged 3–12 months at wave 1 (54 % response rate), 4,606 2–3 year olds at wave 2 (90 % retention from wave 1) and 4,386 4–5 year olds at wave 3 (86 % retention from wave 1).

Compared with the Australian population, children with more highly educated parents were over-represented (by 10 %), while single-parent, non-English speaking families and those living in rental properties were slightly under-represented. There was slightly lower retention to wave 2

for children with less highly educated parents, from non-English speaking backgrounds, or living in rental properties [23], and to wave 3 for children who were Indigenous, living in a less prosperous family, with less highly educated parents, with non-English speaking primary carers, or living in rental properties [24].

The sample for the current analyses was biological fathers of children enrolled in the LSAC infant cohort for whom self-report mental health data were available. At wave 1, LSAC data collection was restricted to fathers who were residing with the child as either the primary or the secondary carer. The primary carer was the parent-figure in the household identified has having the greatest day-to-day responsibility for the child's care. Resident fathers who were identified as primary carers of the child were similar to secondary carers on all key measures apart from work hours and income. Therefore, primary and secondary carers' data were combined and referred to as "resident fathers". At waves 2 and 3, data were also collected from fathers who were not resident in the same household as the child.

For resident fathers who were secondary carers at waves 1, 2 and 3, mental health data were collected by self-report questionnaire, left behind in the home after the study child's mother had completed a face-to-face interview. These were either mailed back or collected by the interviewer at a later date. For primary carer fathers these data were collected on a self-complete questionnaire administered during the face-to-face interview. Questionnaire response rates ranged from 71 to 85 % across the three waves, with over 90 % of responding fathers providing complete mental health data [25].

Data were collected from non-resident fathers at waves 2 and 3 only. Mothers were asked to provide the contact details for non-resident fathers who had at least yearly contact with the study child. At wave 2, these fathers were sent a mail-out questionnaire, of which 24 % were returned [23], with 77 % providing complete mental health data. To redress the poor wave 2 response rate, telephone interviews were conducted with non-resident fathers at wave 3. This resulted in a 67 % response rate [24], with 70 % providing complete mental health data.

The available samples for the analyses were 3,471 resident fathers at wave 1; 3,075 resident fathers, and 90 non-resident fathers at wave 2; and 2,679 resident fathers and 255 non-resident fathers at wave 3. A subset of resident fathers ($n = 2{,}079$) with complete self-report data on the mental health measure at all waves was identified for the analysis of persistent psychological distress in the study population.

To examine the effects of missing mental health data (which ranged across waves and samples from 10 to 30 %), included fathers were compared on a range of socio-demographic variables with those excluded due to missing mental health data. Substantial differences were observed. Greater proportions of included fathers had completed year 12 at school, spoke English at home and worked full-time or long full-time hours than excluded fathers. Included fathers also earned more than excluded fathers. These differences remained even when non-resident fathers were excluded from the comparisons (data available upon request).

Measures

Mental health

Fathers' mental health was assessed using the Kessler-6 (K6) [26]. This screening tool provides a global measure of psychological distress in the past 4 weeks based on participants' reports of the extent to which they have experienced symptoms of feeling nervous, hopeless, restless or fidgety, extremely sad, worthless and that everything was an effort. The six items are rated on a five-point scale (0 = "None of the time" to 4 = "All or most of the time") and summed to give a total score of 0–24, with higher scores indicating greater psychological distress. A scaled score was calculated for fathers who were missing no more than two items. The K6 has been used in several national surveys [27] due to its brevity, strong psychometric properties and ability to identify serious mood and anxiety disorders against DSM-IV criteria with high specificity (0.96) and robust total classification accuracy (0.92) [28].

Consistent with other Australian studies [29, 30], two cut points were used to describe the level of severity of distress. The symptomatic cut point was defined as a score of 8 or more, indicating significant psychological distress. The more stringent clinical cut point was defined as a score of 13 or more, indicating probable clinical diagnosis of a mental health condition.

Socio-demographic characteristics

The following socio-demographic characteristics were used: education level (below year 12; year 12 and above), employment status (unemployed/not in the labour force; part-time work; full-time work; long full-timework), weekly income, language other than English spoken at home (yes; no), Aboriginal and Torres Strait Islander status (yes; no), Socio-Economic Indexes for Area (SEIFA) (index of neighbourhood disadvantage). Employment status and income data were available for non-resident fathers at wave 3 only.

Comparative data from the National Survey of Mental Health and Wellbeing

Comparative data on the prevalence of psychological distress in the Australian adult male population were sourced

from the National Survey of Mental Health and Wellbeing (NSMHWB). This is the only nationally representative sample of Australian adult males with mental health data to which LSAC data on fathers' mental health could be compared. The NSMHWB was conducted by the Australian Bureau of Statistics (ABS) in 2007 and information collected from 8,841 Australians aged 16–85 years living in private dwellings using a stratified multi-stage area-based design. Full survey details have been published elsewhere [31–33]. The survey included a range of measures of mental health including the Kessler 10 from which the Kessler 6 score was derived considering the common subset of questions.

Statistical analysis

The analysis of the NSMHWB and comparisons of LSAC and NSMHWB data were conducted in SAS 9.2 (SAS Institute Inc., Cary, North Carolina, 2008). All other analyses were conducted using the survey method procedures in Stata 11.0 (Statacorp, College Station, Texas, 2009). For LSAC analyses, descriptive statistics and comparisons were weighted to account for the complex survey design and non-response, and first-order Taylor linearization was used to obtain estimates of standard errors taking account of the sampling design. For NSMHWB, standard errors were calculated using Jackknife estimation using the provided replicate weights to account for the complex survey design.

Unpaired *t* test and Chi-square analyses were used to explore differences in the socio-demographic characteristics between resident- and non-resident fathers at each wave. The prevalence of mental health difficulties at each wave was estimated with 95 % confidence intervals using the proportions of fathers with K6 scores indicating no distress (0–7), within the symptomatic range (8–12) and in the clinical range (13–24). Chi-square analyses were used to explore differences in the proportions of resident- and non-resident fathers in the three groups.

The prevalence of mental health difficulties among LSAC fathers was compared with the estimated prevalence in the Australian adult male population using data from the NSMHWB. Fathers from LSAC and men from the NSMHWB were grouped by age (16–29; 30–39; 40–49; ≥50) and SEIFA quintile, and the proportions of individuals in the symptomatic and clinical ranges (K6 score 8–12 and 13–24) were estimated for each group. A logistic regression analysis was used to explore differences between LSAC and the NSMHWB in the proportions of individuals above the symptomatic and clinical cut points, whilst also taking into account SEIFA quintile and age-group.

Finally, the course and persistence of psychological distress for fathers was examined using LSAC resident fathers with complete data across all three waves. Proportions were estimated of fathers with psychological distress across multiple data collection waves, and for those with symptoms at waves 2 or 3, according to their symptoms at previous waves.

Results

Socio-demographic characteristics of fathers participating in LSAC

Socio-demographic characteristics of the included resident (waves 1, 2 and 3) and non-resident fathers (waves 2 and 3) are shown in Table 1. Non-resident fathers were more socio-economically disadvantaged than resident fathers. They were more likely to have failed to complete year 12, be unemployed, have lower incomes and live in a disadvantaged neighbourhood. Non-resident fathers were also more likely to be Indigenous than resident fathers.

Father mental health across the three waves

Proportions of fathers with a K6 score in the symptomatic (K6 score 8–12) and clinical (K6 score 13–24) ranges are shown in Table 2. For resident fathers, the proportions in these two groups were similar across the waves of data collection. For non-resident fathers, a greater proportion were in the symptomatic and clinical ranges; however, given the low response rates, relatively small sample size and the wide confidence intervals for the non-resident fathers group, the statistical significance of this difference could not be reliably ascertained.

Comparisons with NSMHWB data on prevalence of mental health difficulties in study population

The proportions of fathers in LSAC and men in the NSMHWB with psychological distress are shown in Table 3 by age and neighbourhood disadvantage (SEIFA). The logistic regression analysis (Table 4) shows that after taking into account age grouping and SEIFA, LSAC fathers had 1.38 increased odds (95 % CI 1.12–1.69) for psychological distress compared with men in the NSMHWB. While not a focus of the current study, the regression also showed a clear linear gradient for psychological distress by neighbourhood disadvantage. Across both study samples, men from the most disadvantaged neighbourhoods had 1.73 increased odds (95 % CI 1.26–2.37) for psychological distress compared with men from the most advantaged neighbourhoods.

Table 1 Demographic characteristics for resident and non-resident fathers at wave, wave 2, and wave 3

	Wave 1	Wave 2			Wave 3		
	Resident[a] (%) $n = 3,471$	Resident[b] (%) $n = 3,075$	Non-resident[c] (%) $n = 90$	p	Resident[d] (%) $n = 2,679$	Non-resident[e] (%) $n = 255$	p
Education level: year 12 and above	60.9	62.7	44.9	0.001	62.9	46.3	<0.001
Employment status							
Unemployed/not in the labour force	5.6	4.6	n/a	n/a	4.3	11.4	<0.001
Work part-time (1–34 h/week)	7.3	5.7	n/a	n/a	6.0	9.0	0.055
Work full-time (35–44 h/week)	36.9	39.1	n/a	n/a	36.0	39.2	0.305
Work long full-time (45+ h/week)	50.3	50.6	n/a	n/a	53.7	40.4	<0.001
Language other than English at home	10.6	10.8	7.9	0.378	9.7	7.8	0.345
Aboriginal or Torres Strait Islander	1.4	1.2	3.4	0.079	1.1	4.7	<0.001
SEIFA							
1 Least disadvantaged	22.4	21.0	10.0	0.011	23.3	8.2	<0.001
2nd quintile	18.3	20.9	14.4	0.135	20.2	16.9	0.203
3rd quintile	20.1	19.9	18.9	0.811	22.0	22.7	0.801
4th quintile	22.4	18.8	24.4	0.178	17.1	25.1	0.001
5 Most disadvantaged	16.8	19.4	32.2	0.002	17.4	27.1	<0.001
Weekly income from all sources[f]	1,021.7 (749.0)	1,246.0 (877.4)	n/a	n/a	1,492.6 (1,206.9)	1,058.1 (638.1)	<0.001
Age last birthday[f]	31.6 (5.0)	34.0 (4.8)	34.7 (7.7)	0.390	36.1 (4.8)	36.9 (7.2)	0.107
Age of child in months[f]	8.8 (2.5)	33.8 (2.8)	34.3 (2.3)	0.078	57.4 (2.7)	57.9 (3.0)	0.017

n/a not available

[a] Sample size ranged from 3,431 to 3,471 due to missing data

[b] Sample size ranged from 2,989 to 3,075 due to missing data

[c] Sample size ranged from 89 to 90 due to missing data

[d] Sample size ranged from 2,583 to 2,679 due to missing data

[e] Sample size ranged from 250 to 255 due to missing data

[f] Mean (SD)

Table 2 Prevalence of psychological distress in fathers at wave 1, wave 2, and wave 3

Psychological distress	Wave 1		Wave 2				Wave 3			
	Resident $n = 3,471$		Resident $n = 3,075$		Non-resident $n = 90$		Resident $n = 2,679$		Non-resident $n = 255$	
	%	(95 % CI)	%	(95 % CI)	%	(95 % CI)	%	(95 % CI)	%	(95 % CI)
No distress	90.3	(89.2–91.4)	91.8	(90.7–92.8)	82.5	(72.7–89.3)	90.2	(88.8–91.5)	86.2	(80.8–90.3)
Symptomatic range (K6 score 8–12)	7.8	(6.8–8.8)	6.8	(5.8–7.8)	13.8	(7.8–23.1)	7.6	(6.5–8.9)	10.4	(6.8–15.6)
Clinical range (K6 score 13–24)	1.9	(1.4–2.5)	1.4	(1.0–1.9)	3.7	(1.2–10.7)	2.2	(1.6–2.9)	3.4	(1.8–6.1)

Prevalence of persistent mental health problems

The persistence of psychological distress across waves is shown in Table 5. Overall, 17.3 % of fathers had a K6 score above the symptomatic or clinical cut points at one or more waves. Half (50.3 %) reported psychological distress in the postnatal period (wave 1). Of these, 47.1 % were distressed at wave 1 only, reflecting fathers with psychological distress which then resolved over time; 34.5 % stayed above the cut points at least into wave 2, reflecting fathers with a history of recurring periods of or sustained psychological distress; and 18.4 % were above the cut

Table 3 Prevalence of psychological distress in LSAC fathers and NSMHWB men

Age group	NSMHWB SEIFA quintile	Symptomatic range (K6 score 8–12)		Clinical range (K6 score 13–24)	
		LSAC fathers[a] (%)	NSMHWB men[b] (%)	LSAC fathers[a] (%)	NSMHWB men[b] (%)
<30 years	1 Least disadvantaged	12.4 (2.3–22.6)	6.2 (2.2–10.3)	–	0.4 (0.0–1.1)
	2	6.2 (1.0–11.4)	1.9 (0.1–3.7)	3 (0.0–6.2)	1 (0.0–3.2)
	3	5.9 (3.2–8.6)	5.6 (1.1–10.3)	2.7 (0.8–4.7)	0.6 (0.0–2.0)
	4	9.3 (5.5–13.2)	2.8 (0.8–5.0)	2.8 (0.8–5.0)	2.5 (0.0–5.6)
	5 Most disadvantaged	4.5 (0.0–10.9)	7.1 (0.0–14.4)	–	1.6 (0.1–3.3)
30–39 years	1 Least disadvantaged	6.4 (3.4–9.4)	5 (1.1–8.9)	0.9 (0.0–1.9)	–
	2	7.5 (5.5–9.6)	6.8 (0.1–13.5)	1.3 (0.4–2.3)	2.8 (0.0–6.8)
	3	8.4 (5.6–11.3)	2.6 (0.0–5.6)	1.7 (0.7–2.8)	1 (0.0–2.4)
	4	7.9 (5.9–10.1)	4.7 (0.4–9.0)	2 (0.9–3.2)	3.4 (0.1–6.8)
	5 Most disadvantaged	5 (1.8–8.2)	12 (4.4–19.8)	3.1 (0.1–6.2)	1.5 (0.0–3.7)
40–49 years	1 Least disadvantaged	12.3 (5.9–18.9)	2.7 (0.5–5.0)	1.8 (0.0–5.3)	0.5 (0.0–1.6)
	2	6.1 (1.9–10.4)	5.9 (1.0–10.9)	4 (0.5–7.6)	1.6 (0.0–3.5)
	3	12.2 (7.4–17.1)	3.6 (0.9–6.5)	1.7 (0.0–3.7)	0.1 (0.0–0.6)
	4	12.5 (6.7–18.3)	10.2 (1.8–18.7)	2.2 (0.1–4.5)	9.7 (0.0–21.5)
	5 Most disadvantaged	–	4.7 (0.5–9.1)	–	5.9 (0.5–11.3)
≥50 years	1 Least disadvantaged	9.7 (0.0–25.3)	3.7 (1.0–6.5)	–	1.3 (0.0–3.3)
	2	–	2.1 (0.5–3.8)	–	1 (0.0–2.2)
	3	18.6 (0.0–49.8)	3.8 (1.2–6.4)	–	1.7 (0.0–3.9)
	4	9.1 (0.0–20.7)	4.2 (1.3–7.2)	–	2.3 (0.6–4.0)
	5 Most disadvantaged	–	5.4 (2.9–8.0)	–	2.3 (0.8–3.9)

[a] Biological fathers: in the symptomatic ($n = 341$) and clinical ($n = 63$) ranges

[b] NSMHWB men: in the symptomatic ($n = 274$) and clinical ($n = 76$) ranges

Table 4 Odds ratios and (95 %) CIs of experiencing psychological distress (K6 score 8–24), by data source, SEIFA quintile and age group

	OR (95 % CI)	*p*
Data Source (c.f. NSMHWB)		
LSAC	1.38 (1.12, 1.69)	0.002
Age group (c.f. 31–29 years)		
<30 years	1.43 (1.13, 1.81)	0.003
40–49 years	0.79 (0.60, 1.05)	0.100
50+ years	0.95 (0.76, 1.20)	0.674
SEIFA quintile (c.f. Quintile 1, most advantaged)		
Quintile 2	1.01 (0.75, 1.36)	0.955
Quintile 3	1.23 (0.92, 1.63)	0.157
Quintile 4	1.44 (1.10, 1.89)	0.009
Quintile 5 (most disadvantaged)	1.73 (1.26, 2.37)	0.001

points at waves 1 and 3, reflecting fathers with recurring periods of psychological distress that were not sustained consistently over time. Of fathers reporting symptomatic or clinical distress at any wave, 49.7 % reported distress only at waves 2 and/or 3, reflecting fathers who were not distressed during the child's infancy period, but who experienced one-off or recurring symptoms of distress in the following years.

The persistence of K6 scores within the symptomatic and clinical ranges from wave 1 into wave 2 and wave 3 are shown in Table 6. Only 30.4 % of fathers who were within the symptomatic range at wave 1 were also in the symptomatic or clinical ranges at wave 2. In contrast, more than half (53.5 %) of the fathers who were in the clinical range at wave 1 were also in the symptomatic or clinical ranges at wave 2. In addition 60 % of fathers who were above either cut point at both waves 1 and 2 experienced symptomatic or clinical distress into wave 3. This was in contrast with <30 % of fathers in the symptomatic or clinical ranges at either wave 1 or wave 2 only.

Discussion

This study is the first to report on the mental health of a large national sample of Australian biological fathers across the early childhood period from their child's birth to age 4–5 years. While the majority of fathers reported good overall mental health, approximately ten per cent of resident fathers reported psychological distress during the

Table 5 Persistence of psychological distress (K6 score 8–24) in resident biological fathers across waves

Timing of distress	Wave(s)	Proportion of all fathers $n = 2{,}079$ % (95 % CI)	Proportion of those above symptomatic cut point at any wave $n = 345$ % (95 % CI)	Proportion of those above symptomatic cut point at wave 1 $n = 174$ % (95 % CI)
Early infancy period only	1	4.1 (3.3–5.1)	23.7 (19.3–28.5)	47.1 (38.9–54.9)
Extended beyond early infancy	1 + 2 or 1 + 2 + 3	3.0 (2.3–3.9)	17.3 (13.5−21.9)	34.5 (27.2–42.3)
Mixed	1 + 3	1.6 (1.1–2.5)	9.2 (6.4–13.9)	18.4 (12.9–26.7)
Late onset	2, 3, or 2 + 3	8.6 (7.3–10.0)	49.7 (44.2–55.0)	–
No distress	1 + 2 + 3	82.7 (80.8–84.5)	–	–

Table 6 Proportions of fathers with no distress, in the symptomatic range, and in the clinical range into waves 2 and 3 ($n = 2{,}079$)

	No distress	In the symptomatic range (% with K6 score 8–12)	In the clinical range (% with K6 score 13–24)
Distress at wave 1	Distress at wave 2		
No distress	94.9	4.6	0.5
In the symptomatic range	69.6	23.0	7.4
In the clinical cut point	46.5	31.7	21.8
Distress across waves 1 and 2	Distress at wave 3		
No distress	95.5	3.8	0.7
Resolved[a]	71.3	22.5	6.3
Late onset[b]	70.3	20.1	9.6
Persistent[c]	41.3	41.5	17.3

[a] Above the symptomatic or clinical cut points at wave 1; no distress at wave 2

[b] No distress at wave 1; above symptomatic or clinical cut points at wave 2

[c] Above symptomatic or clinical cut points at both wave 1 and wave 2

postnatal period (wave 1), consistent with estimates of postnatal depression reported in previous studies [34]. The proportions of resident fathers reporting distress was also similar across the three waves, highlighting that mental health difficulties extend beyond the postnatal period of fatherhood.

Importantly, this study also reported on the mental health of fathers not living with their children, who represented a small proportion of all LSAC fathers at waves 2 ($n = 90$, 2.9 %) and 3 ($n = 255$, 9.5 %). Rates of symptomatic and clinical distress among these fathers were high at approximately 17 and 14 % at waves 2 and 3, respectively. Although it was not possible to make comparisons between fathers living and not living with their children due to the small sample of non-resident fathers in the present study, these findings are generally consistent with previous research [16, 17, 35] suggesting that fathers who are not living with their children are at particular risk of mental health difficulties in the early childhood period.

A range of factors unique to non-resident fathers may influence their mental health such as conflict with the child's other parent and parenting difficulties. Several studies have documented an association between parenting and psychological distress for non-resident fathers. Divorced fathers report higher parental role strain than married fathers, with this strain predicting increased psychological distress [36]. Higher parental involvement is also positively associated with wellbeing for divorced but not for married fathers [37]. Non-resident fathers who engage with their children on a mainly recreational basis may be at particular risk of distress, as these fathers report less satisfaction with their parenting roles [38]. Further research with larger, representative samples of non-resident fathers is needed to explore how factors such as inter-parental conflict and parenting roles impact on their mental health.

The second aim of this study was to compare the rate of psychological distress for LSAC fathers with rates in the general male adult population using normative data from the National Survey of Mental Health and Wellbeing (NSMHWB). Rates of psychological distress were higher for fathers in the LSAC study with infants (at wave 1) than for men in the NSMHWB. Despite the limitations imposed by differences in the studies, these findings provide an indication that the postnatal period may be a time of increased risk for mental health difficulties in men. As the birth of a baby can result in profound changes to lifestyle and recreation, sleep patterns, couple relationships and identity [14], it is not surprising that adjustment difficulties may arise for fathers at this time. Even for fathers with other children, a new baby often results in increased demands associated with infant care, sleep disruption and

the need to renegotiate the balance between work, parenting, family roles and responsibilities.

While these are normal and expected challenges, some fathers may be particularly vulnerable to psychological distress at this time. A small but growing body of research has shown greater risk of postnatal depression among fathers with a past history of depression, who have a partner with mental health difficulties, who are experiencing relationship difficulties, and/or who have a child with a difficult temperament [6, 9, 20]. It is likely that many other factors (such as sleep deprivation and fatigue, limited social and professional supports, and employment related factors) may contribute to mental health difficulties at this time, and further research in this area is needed.

Finally, the course and persistence of psychological distress for fathers across the early childhood period was examined using data from fathers who lived with their children across all three waves. It was found that postnatal psychological distress had resolved by wave 2 for approximately two-thirds of fathers scoring in the symptomatic range and for approximately half the fathers scoring in the clinical range at wave 1. This is further evidence that for some fathers the postnatal period is a significant time of increased risk and that many fathers may experience a short period of significant distress as they adjust to the life changes brought about by the addition of a new baby to the family. However, we also found that 9 % of fathers experienced late onset psychological distress (distress which commenced after wave 1), indicating that being a parent to a younger child, not just in infancy, represents an increased risk of psychological distress.

Mental health difficulties can be persistent and unrelenting for some fathers. Of the resident fathers who reported symptomatic postnatal psychological distress, approximately 30 % reported continued distress at a similar or worse level over time. The persistence of distress was greater for resident fathers scoring in the clinical range, with 40–60 % reporting continued distress at waves 2 and 3. Given these large proportions with persistent distress, research is needed to identify factors influencing the adjustment process that follows the postnatal period.

There are several limitations of the study, primarily the rates of missing data for father's mental health. Although weighting methods are used to ensure LSAC is representative of the Australian population [23, 24], within the survey there are substantial differences between fathers included in the present analysis and those excluded due to missing data, with included fathers being more socioeconomically advantaged than excluded fathers. The relevance of these results to fathers of lower socioeconomic position remains to be confirmed. Given the well-established association between lower socioeconomic status and poor mental health (also illustrated here by the linear trends between neighbourhood disadvantage and distress in the analyses comparing the LSAC and NMHWB samples), it is likely that these results under-estimate the prevalence of symptoms of psychosocial distress among Australian fathers with young children.

The sample of non-resident fathers was particularly limited and not likely to be representative of all fathers who are not living with their children. The recruitment method for non-resident fathers was changed between waves 2 and 3 to maximise the number of non-resident fathers participating at wave 3. Thus, the comparisons between resident and non-resident fathers at the third wave may be the most reliable. As the proportion of non-resident fathers in LSAC increases over time, it will be possible to extend such comparisons.

Further, data on past history of mental health difficulties were not collected in the questionnaire for secondary carers which included most of the fathers. Therefore, it was not possible to compare fathers who had history of mental health difficulties with those with a new onset of distress after their child was born. Finally, whilst it was possible to control for the effects of neighbourhood disadvantage (SEIFA) and age-grouping in analyses comparing the LSAC and NSMHWB data, there are a number of differences between the studies that we could not control. In particular, the studies differ in timing, scope and context (i.e. one was a broad study of childhood, parenting and family functioning; the other was a study of mental health), and the response rate for fathers participating in LSAC was lower than males participating in NSMHWB. It is acknowledged the NSMHWB male population included both men with and without children, and it is therefore not possible to draw definitive conclusions about differences between LSAC fathers and fathers in the general Australian population. Furthermore, due to differences in the survey designs between the LSAC and the NSMHWB, it was not possible to take into account complex survey design features (stratification and clustering) in analyses directly comparing the two studies, leading to probable slight under-estimation of standard errors. However, past experience with LSAC has shown that adjusting for the complex survey design typically has a limited impact on statistical analyses provided that the study weights are correctly accounted for as they were in this comparison [39, 40].

Despite these limitations, this study of the mental health of a large national sample of Australian fathers has identified some key areas for future research. Research is needed to understand why some fathers experience distress in the postnatal period and across the early childhood period and others do not. A better understanding of the factors associated with the persistence of psychological symptoms beyond the postnatal period, as well as what

precipitates the onset of distress for some fathers as their child gets older is also needed. Importantly, research into the relationship between fathers' mental health, fathering and child outcomes in the early parenting period will complement the large body of work available on maternal mental health. Finally, this study included both fathers who live with their child and fathers who live elsewhere which provides a more inclusive sample of fathers than has previously been available. Future work is needed to gain a better understanding of the factors associated with distress for non-resident fathers, how their parenting may be affected, and how this relates to child outcomes.

This study also has important implications for professionals working with families of young children. In Australia and other countries, much work has gone toward the early identification of maternal postnatal depression through routine screening in universal settings such as maternal and child health services and enhancing access to a range of support options. The current study highlights that there is also a need to increase awareness of fathers' mental health issues in the early childhood period. This may include public health messages about father wellbeing to normalise and promote help-seeking during this time of significant adjustment. It is recommended that routine screening for mental health difficulties also be extended to fathers in the postnatal period and the capacity of practitioners working in early parenting settings strengthened to respond to the specific needs of fathers. This is an important step toward supporting and promoting the wellbeing of the whole family during the early childhood period.

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References

1. Connell AM, Goodman SH (2002) The association between psychopathology in fathers versus mothers and children's internalizing and externalizing behaviour problems: a meta-analysis. Psychol Bull 128:746–773
2. Khan R, Brandt D, Whitaker R (2004) Combined effect of mothers' and fathers' mental health symptoms on children's behavioral and emotional well-being. Arch Pediatr Adolesc Med 158:721–729
3. Kane PP, Garber J (2004) The relation between fathers' depression and children's externalizing and internalizing symptoms and conflict: a meta-analysis. Clin Psychol Rev 24:339–360
4. Mensah FK, Kiernana KE (2010) Parents' mental health and children's cognitive and social development. Families in England in the Millennium Cohort Study. Soc Psychiatry Psychiatr Epidemiol 45:1023–1035
5. Ramchandani P, Stein A, Evans J, O'Connor T (2005) Paternal depression in the postnatal period and child development: a prospective population study. Lancet 365:2201–2205
6. Ramchandani P, Stein A, O'Connor T, Heron J, Murray L, Evans J (2008) Depression in men in the postnatal period and later child psychopathology: a population cohort study. J Am Acad Child Adolesc Psychiatry 47:390–398
7. Goodman JH (2004) Paternal postpartum depression, its relationship to maternal postpartum depression, and implications for family health. J Adv Nurs 45:26–35
8. Paulson JF, Dauber S, Leiferman JA (2006) Individual and combined effects of postpartum depression in mothers and fathers on parenting behavior. Pediatrics 118:659–668
9. Paulson JF, Bazemore SD (2010) Prenatal and postpartum depression in fathers and its association with maternal depression. JAMA 303:1961–1969
10. Ballard C, Davies R (1996) Postnatal depression in fathers. Int Rev Psychiatry 8:65–71
11. Harvey I, McGrath G (1988) Psychiatric morbidity in spouses of women admitted to a mother and baby unit. Br J Psychiatry 152:506–510
12. Matthey S, Barnett B, Howie P, Kavanagh D (2003) Diagnosing postpartum depression in mothers and fathers: whatever happened to anxiety? J Affect Disord 74:139–147
13. Matthey S, Barnett B, Ungerer J, Waters B (2000) Paternal and maternal depressed mood during the transition to parenthood. J Affect Disord 60:75–85
14. Condon JT, Boyce P, Corkindale CJ (2004) The first-time fathers study: a prospective study of the mental health and wellbeing of men during the transition to parenthood. Aust N Z J Psychiatry 38:56–64
15. Bronte-Tinkew J, Moore K, Matthews G, Carrano J (2007) Symptoms of major depression in a sample of fathers of infants: socio demographic correlates and links to father involvement. J Fam Issues 28:61–99
16. Jaffee SR, Caspi A, Moffitt TE, Taylor A, Dickson N (2001) Predicting early fatherhood and whether young fathers live with their children: prospective finding sand policy reconsiderations. J Child Psychol Psychiatry 42:803–815
17. Huang CC, Warner LA (2005) Relationship characteristics and depression among fathers with newborns. Soc Serv Rev 79:95–118
18. Wilhelm K, Parker G (1993) Sex differences in depressiogenic risk factors and coping strategies in a socially homogenous group. Acta Psychiatr Scand 88:205–211
19. Brems C (1995) Women and depression: a comprehensive analysis. In: Beckham EE, Leber WR (eds) Handbook of depression. Guilford Press, New York, pp 539–566
20. Dudley M, Roy K, Kelk N, Bernard D (2001) Psychological correlates of depression in fathers and mothers in the first postnatal year. J Reprod Infant Psyc 19:187–202
21. Australian Bureau of Statistics (2007) National survey of mental health and wellbeing: Summary of results. Australian Bureau of Statistics, Canberra
22. Soloff C, Lawrence D, Johnstone R (2005) Sample design (LSAC Technical Paper, No. 1). Australian Institute of Family Studies, Commonwealth of Australia, Melbourne

23. Misson S, Sipthorp M (2007) LSAC technical paper no. 5: wave 2 weighting and non-response. Australian Institute of Family Studies, Melbourne
24. Misson S, Sipthorp M (2009) LSAC technical paper no. 6: wave 3 weighting and non-response. Australian Institute of Family Studies, Melbourne
25. Australian Institute of Family Studies (2009) Longitudinal Study of Australian Children Data User Guide. Australian Institute of Family Studies, Melbourne
26. Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, Howes MJ, Normand SL, Manderscheid RW, Walters EE, Zaslavsky AM (2003) Screening for serious mental illness in the general population. Arch Gen Psychiatry 60:184–189
27. Furukawa TA, Kessler RC, Slade T, Andrews G (2003) The performance of the K-6 and K-10 screening scales for psychological distress in the Australian National Survey of Mental Health and Well-being. Psychol Med 33:357–362
28. America Psychiatric Association (2004) Diagnostic and statistical manual of mental disorders IV. American Medical Association, Washington, DC
29. Martin J, Hiscock H, Hardy P, Wake M (2007) Adverse association of infant and child sleep problems and parent health: an Australian population study. Pediatrics 119:947–995
30. Strazdins L, Shipley M, Broom DH (2007) What does family-friendly really mean? Well-being, time and the quality of parents' jobs. Aust Bull Labour 33:202–225
31. Slade T, Johnston A, Oakley Browne MA, Andrews G, Whiteford H (2009) 2007 National survey of mental health and wellbeing: methods and key findings. Aust N Z J Psychiatry 43:594–605
32. Australian Bureau of Statistics (2009) National survey of mental health and wellbeing: User's guide, 2007. Australian Bureau of Statistics, Canberra
33. Australian Bureau of Statistics (2009) National survey of mental health and wellbeing: Technical manual, 2007. Australian Bureau of Statistics, Canberra
34. Paulson JF, Bazemore SD (2010) Prenatal and postpartum depression in fathers and its association with maternal depression. JAMA 303:1961–1969
35. Bronte-Tinkew J, Moore K, Matthews G, Carrano J (2007) Symptoms of major depression in a sample of fathers of infants: sociodemographic correlates and links to father involvement. J Fam Issues 28:61–99
36. Umberson D, Williams CL (1993) Divorced fathers: parental role strain and psychological distress. J Fam Issues 14:378–400
37. Eggebeen DJ, Knoester C (2001) Does fatherhood matter for men? J Marriage Family 63:381–393
38. Amato PR, Sobolewski JM (2004) The effects of divorce on fathers and children: non residential fathers and stepfathers. In: Lamb ME (ed) The role of the father in child development, 4th edn. Wiley, Hoboken, pp 341–367
39. Nicholson JM, Lucas N, Berthlesen D, Wake M (2010) Socioeconomic inequality profiles in physical and developmental health from 0–7 years: Australian National Study. J Epidemiol Community Health. doi:10.1136/jech.2009.103291
40. Lucas N, Neumann N, Kilpatrick N, Nicholson JM (2011) State-level differences in the oral health of Australian preschool and early primary school-age children. Aust Dental J 56:56–62