Original Contribution

New Fatherhood and Psychological Distress: A Longitudinal Study of Australian Men

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Despite growing interest and concern about men’s mental health during the perinatal period, we still do not know whether men are more vulnerable to mental health problems during this time. The current study is one of the first to use longitudinal, population-based data to investigate whether becoming an expectant and/or new father is associated with increases in psychological distress. We analyzed 10 waves of data collected annually (from 2001 to 2010) from the nationally representative Household, Income, and Labour Dynamics in Australia (HILDA) Survey. Over this time, 349 men were identified as new fathers (first child aged <1 year), and 224 of these men had been identified as “expectant fathers” during the previous wave. A total of 1,658 men remained “never fathers.” Psychological distress was measured using the 5-item Mental Health Inventory before the partner’s pregnancy, during the partner’s pregnancy, and during the first year of fatherhood. Longitudinal mixed models showed no significant increase in psychological distress as a function of expectant or new fatherhood; instead, some improvement in mental health was observed. The finding suggests that expectant and new fathers are not at greater risk of poor mental health. Future epidemiologic research should continue to identify those men who are most (and least) at risk during the perinatal period in order to target resources and assistance most effectively.

fatherhood; longitudinal study; men; mental health; perinatal period; psychological distress

Abbreviations: HILDA, Household, Income, and Labour Dynamics in Australia; MHI-5, 5-item Mental Health Inventory.

The transition to parenthood is a time of considerable change. New roles must be negotiated in partner relationships alongside additional financial and time pressures (1). The impact of pregnancy and new motherhood on women’s mental health has been researched extensively, with findings indicating that women may be at greater risk during the immediate postpartum period (0–3 months) (2). Despite knowledge that both mothers’ and fathers’ mental health affects infants’ emotional and cognitive development (3), comparatively little is known about men’s mental health during this transition.

It remains uncertain whether the perinatal period is a time of increased risk for men’s psychological distress. This uncertainty is chiefly due to a lack of prospective, longitudinal research. Point-prevalence (cross-sectional) estimates have been compared between postpartum men and men in the general population in an attempt to determine whether the perinatal period is a time of increased risk. For example, a meta-analysis of 43 studies reported pooled prevalence rates of postpartum depression of 8% from birth to 3 months, 26% from 3 to 6 months, and 9% from 6 to 12 months (4). In addition, Goodman (5) reported a pooled prevalence of 10.1% during the first postpartum year across 20 studies. These pooled estimates can be compared with the prevalence of disorders in the general population of men (e.g., the 12-month prevalence rates of any affective disorder are 8.4% for Australian men aged 35–44 years (6) and 7.4% for American men aged 35–49 years (7)). However, there are several problems with this approach. The substantial heterogeneity in the reported prevalence of depression in perinatal men presents a problem. For example, Paulson et al. (4) reported in their meta-analysis that the prevalence of depression ranged from 1% to 35%. In addition, the vast majority of samples in this meta-analysis were small and recruited via convenience methods (e.g., attendees of antenatal classes) that may not
represent experiences of fatherhood in the wider population. Given that the transition to fatherhood (i.e., the birth of the first child) may be particularly stressful because of changes in partner roles and responsibilities, many studies have specifically focused on first-time fatherhood. Rates for depression in first-time fathers also vary widely, with reports between 2% and 13% at 1–3 months postpartum (8–12), 2%–6% at 3–6 months postpartum, and 2%–5% at 12 months postpartum (9, 11, 12).

Changes in mental health across the transition to fatherhood are best tested using longitudinal, population-level data. The same sample of men can be followed over time, with mental health assessed before, during, and after the antenatal period. Several studies have examined changes in the psychological symptoms of expectant and postnatal fathers within the antenatal and/or postpartum period (9, 11, 13, 14); however, far less research has investigated whether men’s mental health changes in accordance with becoming a parent. Most recently, McKenzie and Carter (15) used 3 waves of longitudinal data to examine the impact of new parenthood on mental health (n = 6,670) and found that both first-time and “subsequent” parents reported a decrease in psychological distress. Two smaller studies conducted by Keizer et al. (16) (n = 600) and Nomaguchi and Milkie (17) (n = 1,933) used 2 waves of data and reported no difference in the wellbeing of those who became new parents versus those who did not. No previous longitudinal research has specifically examined how men’s mental health might change when their partners become pregnant (i.e., during expectant fatherhood). Given the large body of research focused on women’s mental health during pregnancy, this time period warrants further investigation in men.

The current study used 10 waves of Australian longitudinal, population-based data to investigate whether expectant or new (first-time) fatherhood is associated with an increase in psychological distress. Psychological distress was measured by using the 5-item Mental Health Inventory (MHI-5) before pregnancy, during pregnancy, and during the first year of fatherhood. The prospective design of the study, with the unique inclusion of data when men were both expectant and new fathers, provides an important addition to the existing literature.

**METHODS**

**Study design and sample**

Data were from 10 waves of the Household, Income, and Labour Dynamics in Australia (HILDA) Survey, version 10.0, which is a nationally representative household panel survey that has been conducted annually since 2001. The HILDA Survey was approved by the human research ethics committee at the University of Melbourne (Melbourne, Australia). The HILDA Survey used a multistage sampling approach, sampling households within a selection of administrative areas. At baseline, there were 7,682 responding households (66% response rate), including 13,969 household members aged 15–95 years (92% of the eligible population) who completed personal interviews (18).

Analyses were restricted to men aged 15–50 years at baseline (n = 4,435), given that this age range captures the typical period during which men become first-time fathers. Over the 10 waves, 349 men became new fathers (i.e., had 1 child aged <1 year) at some point in time, and of these men, 224 were identified as expectant fathers (i.e., their partners were pregnant) at the previous wave of interviews. Identification of first-time expectant fathers was calculated using the interview date and the child’s date of birth. Not all men who were identified as new fathers were expectant fathers at the previous wave of interviews, because interviews were conducted at least 1 year apart. Because the focus of the current study was on the transition to fatherhood, only first-time new and expectant fathers were studied. A further 2,211 men were already fathers at baseline, and 1,658 men remained “non-fathers” across all time points.

**Measures**

**Fatherhood.** Three indicator variables were created to identify the impact of within-person transitions from prepregnancy to expectant and new fatherhood. For “expectant fatherhood,” men were coded as 1 when they were expectant fathers and as 0 at all other times, identifying time points when men’s partners were pregnant. For “new fatherhood,” men were coded as 1 when they had a first child less than 1 year of age and as 0 at all other times, identifying time points when men were new fathers. For “ongoing fatherhood,” men were coded as 1 at any time point during which they were fathers, regardless of the child’s age or the father’s number of children, and as 0 at any time when they were not fathers. For each of these 3 time-varying indicator variables, men were referenced to themselves before they became either new, expectant, or “ongoing” fathers. A final time-invariant, between-person index identified men who were not fathers at any time during the study (coded as 1), as opposed to those who were fathers at some point (coded as 0). Table 1 provides examples of how different fatherhood experiences were coded.

**Mental health.** Mental health was assessed using the MHI-5, a subscale from the Short Form (SF-36) General Health Survey (19). The MHI-5 has been used to identify mental disorders in the community using Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Axis I, diagnosis as the “gold standard” and has been recommended for use in screening for anxiety and depressive

<table>
<thead>
<tr>
<th>Fatherhood Status</th>
<th>Wave a</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Expectant b</td>
<td>0</td>
</tr>
<tr>
<td>New father b</td>
<td>0</td>
</tr>
<tr>
<td>Ongoing fatherhood</td>
<td>0</td>
</tr>
<tr>
<td>Never father c</td>
<td>0</td>
</tr>
</tbody>
</table>

* a A “1” indicates a positive status (e.g., as an expectant father), and a “0” indicates a negative status (e.g., not an expectant father).

b Time-varying variable.

* Time-invariant variable.
disorders (20, 21). The MHI-5 assesses symptoms of depression and anxiety, as well as positive aspects of mental health in the past 4 weeks (e.g., How much time during the last month have you 1) been a very nervous person, 2) felt calm and peaceful, 3) felt down-hearted and blue, 4) been a happy person, and 5) felt so down in the dumps nothing could cheer you up?). Scores range from 0 to 100, with higher scores representing better mental health. Descriptive statistics used a dichotomized form of the MHI-5; however, all other analyses used the continuous measure. For the dichotomous score, men with scores of less than 50 were categorized as having a mental health problem. This cutpoint was chosen on the basis of previous research investigating the screening utility of the MHI-5 (against diagnosis for anxiety and depression disorders made using the Composite International Diagnostic Interview (22)).

**Covariates.** Relevant covariates included the following: age at baseline, marital status (married, de facto, separated/divorced, or never married), educational level (high school incomplete, high school graduate, or tertiary school graduate), and employment status (employed, unemployed, or not in the labor force). A measure of financial hardship was calculated on the basis of 7 dichotomous items that assessed lack of basic goods and opportunities (23). We calculated a 3-category summary measure representing no experience of financial hardship, 1 experience, or 2 or more experiences. Financial hardship data were not available in wave 10 of the HILDA Survey; therefore, this variable was coded as missing for this wave only (allowing use of this variable in all other waves of data). Physical health was assessed by using the Short Form (SF-36) General Health Survey physical functioning subscale, which ranges from 0 to 100 (19).

**Analysis**

Linear multilevel or growth curve models were used to test the longitudinal associations between fatherhood and mental health. These “mixed” models simultaneously test fixed and random effects. All models included a random intercept to capture the individual variability in mental health at baseline, a random slope for time (i.e., wave) representing individual differences in the linear effect of time on mental health (i.e., growth), and the covariance between these 2 terms. With the coding of the fatherhood variables described above, the (fixed effect) coefficients represent the within-person change in mental health associated with transitions to expectant father and new father status, while also modeling the between-person differences for those men who are fathers at some point in time versus those who do not become fathers during the study period. Descriptive analyses were weighted to reflect population characteristics using the person-level sample weights supplied with the HILDA data set. The jack-knife method was used to calculate robust standard errors and confidence intervals adjusted for the complex survey design. Rate differences among the fatherhood groups at baseline (Table 2) were tested using Wald’s $\chi^2$ test.

Modeling comprised 3 stages. Model A regressed mental health on time-varying fatherhood circumstances (expectant father and new father), while adjusting for age, time, ongoing fatherhood, and the time-invariant “never father.” Model B included marital status as a time-varying covariate. Model C included the remaining time-varying covariates as follows: educational level, employment status, financial hardship, and physical functioning. Cases with missing data were minimal (range, 0%–2.6% of items within waves except for financial hardship items, which were missing for all respondents in wave 10) and so were excluded on an analysis-by-analysis basis. The longitudinal methods used do not require a balanced panel. The analyses used data from all waves in which they were available, thus maximizing the number of observations available for analysis.

A series of follow-up analyses were also conducted. The first analysis investigated time-dependent confounding with respect to the socioeconomic variables of financial hardship and employment status, because previous research suggests possible reciprocal pathways with fatherhood and mental health (15). The second analysis examined whether adjustment for income altered the findings. The third analysis used a more restricted age range (15–40 years) to capture the most common ages at which men become new fathers. Finally, sensitivity analyses using only respondents with complete data (balanced panel) examined whether attrition affected the findings. All analyses were conducted using Stata, version 11.2, software (StataCorp LP, College Station, Texas).

**RESULTS**

**Descriptive statistics**

Baseline characteristics are shown in Table 2 by fatherhood status. There were several significant differences. Men who were already fathers at baseline were significantly older ($P < 0.001$), had poorer physical health ($P < 0.001$), and were more likely to be married or separated/divorced than men who were or would become fathers during the study and men who were never fathers (Wald $\chi^2$ (df = 6) = 9.304, $P < 0.001$). Men who became new fathers at a later time point were more likely to have tertiary education (Wald $\chi^2$ (df = 4) = 129, $P < 0.001$) and employed (Wald $\chi^2$ (df = 4) = 121, $P < 0.001$) compared with never fathers. At baseline, there were no significant differences among the fatherhood groups in levels of psychological distress or the proportion of those with mental health problems.

The average MHI-5 scores (across waves) were 79.71 (standard deviation, 12.39) when men were expectant fathers and 78.96 (standard deviation, 13.59) when men were new fathers. The average mental health score at all other time points (when men were not expectant or new fathers), for all men, was 74.64 (standard deviation, 16.39).

**Expectant and new fatherhood transitions**

Table 3 presents results from the longitudinal models examining the association between fatherhood circumstances and mental health over time. Model A shows that men had significantly better mental health when they were expectant fathers ($\beta = 3.05$, $P < 0.001$) compared with before this time (representing within-person change). That is, men scored 3 points higher on the MHI-5 when they were expectant fathers compared to during the prepregnancy time period. Previous research has shown that a difference of 4 points is clinically
relevant, suggesting that the current difference is important (24). The model also shows that when men were new fathers, they had significantly better mental health than before this time ($\beta = 2.47, P = 0.001$) (representing within-person change). Adjustment for ongoing fatherhood in model A ensured that the estimates for expectant and new fatherhood represent these acute states or time points compared with those before the men had children. Model A also incorporated never fatherhood—a between-person term representing (and adjusting for) no experience of fatherhood. The inclusion of this term removes between-person differences, ensuring that other terms represent within-person change. This term was significant ($\beta = -1.55, P = 0.011$), suggesting that, overall, individuals who were never fathers had poorer mental health than those who were, or who went on to become fathers. Model B shows that “never fatherhood” was no longer associated with mental health once marital status was accounted for (between-person difference). Model B also shows that after adjustment for marital status (and the associated mental health benefits), men had poorer mental health when they were ongoing fathers ($\beta = -1.25, P < 0.001$) (representing within-person change). This association did not remain in model C, which included a range of additional socioeconomic covariates. Model C shows that men continued to have better mental health when they were expectant or new fathers than before this transition. Figure 1 displays predicted scores from model C.

### Additional analyses

Further analyses investigated time-dependent confounding regarding the socioeconomic variables of financial hardship and employment status. These analyses provided no evidence that current financial hardship or employment status was predicted by prior fatherhood status (controlling for prior hardship and employment status), suggesting that these socioeconomic...
factors are unlikely to mediate the association between new fatherhood and mental health. Additional analyses provided no evidence that current fatherhood status was predicted by prior financial hardship (when controlling for prior fatherhood status), alleviating concerns about reverse causality for this covariate. However, current fatherhood status was predicted by prior employment status, such that being employed was associated with increased likelihood of becoming a father in the subsequent wave (odds ratio = 1.19, P < 0.001).

A range of other supporting analyses largely demonstrated the robustness of the results. The estimates for the fatherhood variables showed minimal change when a continuous

**Table 3. Longitudinal Random Intercept Regression Models Assessing the Relationship Between Fatherhood Status and Mental Health, HILDA Survey Sample, 2001–2010**

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Model A</th>
<th></th>
<th></th>
<th>Model B</th>
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<th>Model C</th>
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<tbody>
<tr>
<td></td>
<td>β</td>
<td>95% CI</td>
<td>β</td>
<td>95% CI</td>
<td>β</td>
<td>95% CI</td>
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<td>Expectant father</td>
<td>3.05b</td>
<td>1.43, 4.66</td>
<td>2.07c</td>
<td>0.44, 3.70</td>
<td>2.01b</td>
<td>0.36, 3.67</td>
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<td>New father</td>
<td>2.47d</td>
<td>1.05, 3.88</td>
<td>2.21e</td>
<td>0.79, 3.63</td>
<td>2.07a</td>
<td>0.57, 3.57</td>
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<tr>
<td>Ongoing fatherhood</td>
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<td>−1.31, 0.47</td>
<td>−1.25c</td>
<td>−0.22, −0.33</td>
<td>−0.86</td>
<td>−1.82, 0.09</td>
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<td>Age</td>
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<td>−0.03</td>
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<td>−0.06, 0.03</td>
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<tr>
<td>Never father</td>
<td>−1.55c</td>
<td>−2.75, −0.36</td>
<td>−0.68</td>
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<td>−0.55</td>
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<td>Married</td>
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<tr>
<td>De facto</td>
<td>−1.33b</td>
<td>−2.05, −0.61</td>
<td>−0.98b</td>
<td>−1.73, −0.23</td>
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<tr>
<td>Separated/divorced</td>
<td>−4.96b</td>
<td>−5.83, −4.10</td>
<td>−4.08b</td>
<td>−4.99, −3.17</td>
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<td>Never married</td>
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<td>High school graduate</td>
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<td>Employment status</td>
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<td>Employed</td>
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<td>Unemployed</td>
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<td>Not in the labor force</td>
<td>−2.63b</td>
<td>−3.33, −1.93</td>
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<td>No. of financial hardships experienced</td>
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<td>0</td>
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<td>1</td>
<td>−2.05b</td>
<td>−2.54, −1.56</td>
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<td>≥2</td>
<td>−4.92b</td>
<td>−5.46, −4.39</td>
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<td>Physical health score</td>
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<td>0.11, 0.13</td>
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<td>Study wave</td>
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<td>0.00, 0.12</td>
<td>0.04</td>
<td>−0.02, 0.10</td>
<td>−0.02</td>
<td>−0.09, 0.04</td>
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<td>Constant</td>
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<td>73.32, 76.94</td>
<td>77.59b</td>
<td>75.65, 79.53</td>
<td>66.89b</td>
<td>64.59, 69.16</td>
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<td>Random effects</td>
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<tr>
<td>Intercept</td>
<td>180.25</td>
<td>169.89, 191.25</td>
<td>176.14</td>
<td>165.94, 186.97</td>
<td>154.07</td>
<td>144.29, 164.51</td>
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<td>Slope</td>
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<td>1.13, 1.42</td>
<td>1.27</td>
<td>1.13, 1.42</td>
<td>1.45</td>
<td>1.27, 1.66</td>
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<td>Covariance</td>
<td>−5.83</td>
<td>−6.88, −4.78</td>
<td>−5.87</td>
<td>−6.92, −4.83</td>
<td>−6.42</td>
<td>−7.60, −5.24</td>
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<td>Residual variance</td>
<td>106.44</td>
<td>104.46, 108.47</td>
<td>106.17</td>
<td>104.19, 108.19</td>
<td>103.9</td>
<td>101.78, 106.06</td>
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</tbody>
</table>

Abbreviations: CI, confidence interval; HILDA, Household Income, Labor, Dynamics in Australia.

a Time varying; expectant father denoted by 1, and all other time points denoted by 0.
b P < 0.001.
c P < 0.05.
d Time varying; new father (with 1 child aged < 1 year) denoted by 1, and all other time points denoted by 0.
e P < 0.01.
f Time varying; ongoing fatherhood (with any number of children at any age) denoted by 1, and all other time points denoted by 0.
g Time invariant; never a father in the study denoted by 1, and a father at some point in the study denoted by 0.
h De facto status refers to individuals living with a partner, but not married.
i Physical health was assessed by using the Short Form (SF-36) General Health Survey physical functioning subscale.
j The constant represents the predicted mental health score at baseline (time 0) when all other variables in the model are set to 0.
Figure 1. Predicted mean 5-item mental Health Index (MHI-5) scores for transitions into fatherhood, Household Income, Labour, Dynamics in Australia (HILDA) Survey sample, 2001–2010. Predicted mean mental health score plotted at the following levels of covariates: married, a post–high school qualification (e.g., certificate/diploma/degree), employed, no financial hardships, wave 5, and at the mean of all continuous variables (e.g., age = 32.4 years; physical health score = 89.8). Exact scores graphed as follows: before fatherhood, 77.12; expectant father, 79.15; new high school qualification (e.g., certificate/diploma/degree), employed, no financial hardships, wave 5, and at the mean of all continuous variables (e.g., age = 32.4 years; physical health score = 89.8). Exact scores graphed as follows: before fatherhood, 77.12; expectant father, 79.15; new father, 78.33; ongoing fatherhood, 76.26; and never father, 76.58.

measure of income was included as a covariate. Restriction of analyses to men aged 15–40 years resulted in few expectant ($n = 220$) and new ($n = 281$) fathers; however, the findings regarding fatherhood were consistent. Finally, analyses were repeated including only complete cases ($n = 2,240$; balanced panel), because response bias and attrition can influence longitudinal analysis. Again, the findings for expectant ($n = 175$), new ($n = 218$), and ongoing fatherhood showed minimal change. However, the negative estimate of “never fatherhood” was significant in the final model ($\beta = -1.85, P = 0.013$) with complete cases. This may reflect attrition by some men coded as never fathers, but who went on to have children after they left the study.

RESULTS

The results of this study provide no evidence that expectant or new (first-time) fatherhood is a risk factor for psychological distress. We found that men who were not fathers reported poorer mental health than men who were fathers. However, this association was attributable to the lower rates of partnered men in the former group.

The current findings are thought provoking given growing concern over perinatal depression and anxiety in men. Research has shown that stressful life events are associated with increases in psychological distress (25). Previously, the focus has been on “threatening life experiences,” such as serious injury, assault/theft, major financial difficulties, or the death of someone close (26). However, it is also possible that more common life transitions, such as leaving home, entering intimate partner relationships, and having children might also be risk factors for psychological distress. The current study also solicits this question in relation to new fatherhood and finds that, although new fatherhood may be stressful and a major life change, it is not usually accompanied by deterioration in mental health.

This does not mean that expectant and new fatherhood will have no psychological impact on men. There is likely to be significant variation in men’s responses to having a first child; some men may find this transition difficult, and others may find it positive and empowering (27). A number of risk factors for postnatal depression in men have been identified, including partner’s depression and poor relationship satisfaction (28). Conversely, new fatherhood can include experiences of pleasure and pride (27). The lack of association between new fatherhood and distress in the current study may represent the “averaged” impact of fatherhood across the various positives and negatives when all new fathers are considered together. Although we did model individual variability in men’s mental health (at baseline) via a random intercept, we did not assess heterogeneity in the variance of different groups. Accordingly, future analyses should continue to identify which men are most at risk of psychological distress during the perinatal period.

Our findings are consistent with those of the only other identified study using similar analytical methods. McKenzie and Carter (15) analyzed 3 waves of population-level data. They found that the transition to parenthood (for men and women) led to improved mental health. This result remained after adjustment for partner status, area-level deprivation, labor force status, and household income. Two other population-based studies analyzing 2 waves of data also found no decreases in wellbeing for new fathers (16, 17).

The finding that men who did not become fathers were more likely to have poorer mental health than men who did (model A) is consistent with research showing that men with mental health problems are less likely have partners and children (6). Relationship status was found to explain differences
in distress between “never fathers” and other men (model B). This reiterates the benefits of marriage and intimate partnerships for men’s psychological wellbeing (29). Fertility issues may also play a role in the association between never being a father and poorer mental health, given that past research has shown that men with fertility problems are more likely to have poorer mental health (30).

Study limitations

A number of limitations of the current study should be noted. First, the impact of expectant and new fatherhood in narrow timeframes (e.g., 1–3 months postpartum) could not be assessed confidently with the sample size available. The transition to fatherhood may have differential effects on men’s psychological distress during particular windows of time (31). Also, expectant fatherhood data were not available for all men who became new fathers, given variation in the interval of time between interviews. Diagnostic measures of mental health (i.e., mental disorders) and measures specifically designed for the perinatal period were not available. However, the MHI-5 score is a valid indicator of mental health in the general community (22) and does not contain somatic items that may confound estimates during the perinatal period (e.g., fatigue, sleep problems (32)). The current study was not designed to explore how mental health might vary between different types of new fathers; for example, nonresident fathers and single fathers may have different experiences. The current study was focused on fatherhood and, thus, did not examine the transition to parenthood for men and women concurrently; however, previous longitudinal research has suggested that, across the first year, the impact on mental health may be similar for parents of both sexes (15). Other research shows that men who do experience mental health problems at this time are more likely to have partners with poor mental health (33). In addition, the current study does not thoroughly examine the processes via which new fatherhood might affect mental health. A brief investigation of the socioeconomic variables showed that those who were employed were more likely to become new fathers. Given that employment status is also associated with mental health (34), this may be an important variable for future investigation. Finally, although the study uses the category “never father” to identify those who did not have children within the 10-year study period, a proportion of these men may go on to become fathers after the study period. A longer time period is needed to more thoroughly assess the impact of never becoming a father.

Conclusions

The findings suggest that new fatherhood is not typically detrimental to mental health and wellbeing. Rather, men’s distress was found to be lower when they were expectant and new fathers compared with prior to the transition to fatherhood. Uniquely, this study analyzed a large number of transitions (10 waves), examined the impact of “expectant” fatherhood, and included prepregnancy data. Moreover, we controlled for potential differences between men who become fathers versus those who do not by including the “never father” variable. Future research should examine the nuances of these findings and investigate variability in the responses to new fatherhood to identify the characteristics of those with poor outcomes and best target support.

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