

Title

Preconception predictors of expectant fathers' mental health:

[finding from a](#) 20-year cohort study from adolescence.

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100 words

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Summary

To write once intro/discussion finalised

Data come from a prospective intergenerational cohort study (VIHCS: The Victorian Intergenerational Health Cohort) which assessed anxiety and depression 9 times from age 14-29 years, and then in the third trimester of subsequent pregnancies to age 36 years (N=295 pregnancies to 214 men).

Men with a history of mental health problems from adolescence are at increased risk of mental health problems during the perinatal period and may therefore benefit from support when planning pregnancies and throughout the perinatal period.

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Short reports require an unstructured summary of one paragraph, not exceeding 100 words. The report should not exceed 1200 words (excluding references, tables and figure legends) and contain no more than one figure or table and up to 10 essential references beyond those describing statistical procedures, psychometric instruments and diagnostic guidelines used in the study. Short reports will not exceed two printed pages of the *BJPsych* and authors may be required to edit their report at proof stage to conform to this requirement. This may be necessary even if the report does not exceed 1200 words if a figure or table is unduly large.

Structure recommended: Aims and method; Results; Clinical implications; Declaration of interest.

Introduction

There is increasing ~~focus-interest in on~~ men's perinatal mental health ~~perinatally and in the transition to parenthood~~. Recent studies suggest that one in ten fathers experience mental health problems during pregnancy ~~and in the first year postpartum~~ (1, 2). These problems are significant because ~~of their effects on men, their relationships with partners, and care-giving responsiveness to their infants (REF), and can emerge during pregnancy.~~ Antenatal paternal mental health problems are risk factors for postnatal paternal depression (3), father-child relational difficulties and offspring emotional and behavioural problems (4). Little is known about risk factors for antenatal mental health problems in fathers because studies with p, but have received comparatively little attention. Understanding who is at risk is important for early intervention, but pprospective data on studies of preconception risk factors are scarce. men prior to prior to conception are scarce. Drawing on data from a 20-year 2-generation study that followed young men and women from adolescence to parenthood, we aimed to examine the extent to which a history of depression and anxiety in the decades prior to conception predicts the risk of antenatal mental health problems.

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Other possible refs:

Leach, L. S., Olesen, S. C., Butterworth, P., & Poyser, C. (2014). New Fatherhood and Psychological Distress: A Longitudinal Study of Australian Men. *American Journal of Epidemiology*, 180(6), 582-589. doi:10.1093/aje/kwu177

Leach, L. S., Mackinnon, A., Poyser, C., & Fairweather-Schmidt, A. K. (2015). Depression and anxiety in expectant and new fathers: Longitudinal findings in Australian men. *The British Journal of Psychiatry*, 206(6), 471-478. doi:10.1192/bjp.bp.114.148775

Leach, L. S., Poyser, C., Cooklin, A. R., & Giallo, R. (2016). Prevalence and course of anxiety disorders (and symptom levels) in men across the perinatal period: A systematic review. *Journal of Affective Disorders*, 190, 675-686. doi:10.1016/j.jad.2015.09.063

World Health Organisation (2015)

Garfield, Craig F. "Supporting fatherhood before and after it happens." *Pediatrics* 135.2 (2015): e528-e530.

Method

Participants

The Victorian Intergenerational Health Cohort Study (VIHCS) is a prospective intergenerational study of preconception predictors of infant and child health. It arose from a nine-wave cohort study commencing in 1992 in Victoria, Australia (VAHCS; The Victorian Adolescent Health Cohort), as described previously (5). Briefly, a close-to-representative sample of 1943 mid-secondary school students (1000 male) was selected using a two-stage cluster sampling procedure. Participants were assessed six-monthly during adolescence (Waves 1-6, mean age 14.9-17.4) and three times in young adulthood (Wave 7: 20.7 years; Wave 8: 24.1 years; Wave 9: 29.1 years).

Between 2006 and 2013, the 1638 study members (766 male) still active in VAHCS were screened for participation in VIHCS (The Victorian Intergenerational Health Cohort) via 6-monthly contacts. Study members who reported that they or their partner were pregnant, or had recently had a child, were invited to complete telephone interviews in trimester three (Wave 1), 2 months' postpartum (Wave 2), and 12 months postpartum (Wave 3). Study members were invited to participate for every child born during the recruitment phase, and many participated with more than one child.

Appendix A shows the flow of male participants in VAHCS and VIHCS. In the present analyses, we used data from 214 male VAHCS participants who participated in VIHCS with 295 pregnancies (response 65% of men with 55% of pregnancies). Participants' parents or guardians provided informed written consent at recruitment for VAHCS, and participants provided informed verbal consent at subsequent VAHCS and VIHCS waves. Data collection protocols were approved by the human research ethics committee at the Royal Children's Hospital, Melbourne.

Measures

Exposures: Preconception mental health problems were measured at VAHCS Waves 1-7 using the Revised Clinical Interview Schedule (CIS-R; 6), and at Waves 8-9 using the 12-item General Health Questionnaire (GHQ-12; 7, 8). Continuity of mental health problems from adolescence to young adulthood was defined as none, adolescent-only, young adult-only, or both adolescent and young adult problems. Adolescent risky behaviours (≥ 20 drinks on a single day in the past week, daily smoking, and weekly cannabis use) were assessed in VAHCS Waves 1-6. Summary variables were defined as the presence of each risky behaviour at one or more adolescent waves. Participants also reported on country of birth, their parents' highest level of education, and their parents' separation or divorce.

Outcomes: Paternal antenatal mental health was assessed at VIHCS Wave 1, in the third trimester of pregnancy, using the 12-item General Health Questionnaire (GHQ-12; 7, 8).

We used two-sample tests of proportion to compare characteristics of a) VAHCS men available for VIHCS screening with those who had died, withdrawn or been lost to contact, and b) VIHCS participants with those who reported pregnancies but did not participate. We estimated the prevalence of paternal antenatal mental health problems in the analysis sample of 214 men with 295 pregnancies, stratified by continuity of preconception mental health problems. Associations were estimated as unadjusted and adjusted risk ratios, using generalised estimating equations with robust standard errors due to within-family clustering.

Results

When compared to the 766 men screened for pregnancies, the 177 men who were no longer active in VAHCS when VIHCS screening commenced were less likely to be born in Australia ($p<.001$) and have completed secondary education ($p=0.016$). There was no difference between groups in adolescent mental health problems. Measurements of mental health problems and background demographics gathered at the commencement of VIHCS recruitment did not differ between men who participated in VIHCS and those who reported a pregnancy but did not participate.

[Insert Table about here](#)

In total, 95 (39.7%) of the 214 men in the analysis sample reported preconception mental health problems at least once: 35 (16.4%) during adolescence only; 25 (11.6%) during young adulthood only; and 25 (11.7%) during both adolescence and young adulthood (Appendix A). Antenatal mental health problems were reported in 31 (10.5%, CI 7.0-14.0) of the 295 pregnancies in the analysis sample.

[-Expectant fathers with no history of mental health problems reported antenatal depressive symptoms in one in twenty pregnancies, while men with a history of mental health problems in adolescence and young adulthood reported antenatal mental health problems in one in four pregnancies.](#)

Men with preconception mental health problems in both adolescence and young adulthood had the greatest risk of antenatal [mental health problemsdepressive symptoms](#) (Table 1). Those with mental health problems in young adulthood only were also at increased risk of antenatal [mental health problemsdepressive symptoms](#). ~~T-while~~ there was no evidence of increased risk for antenatal [mental health problemsdepressive symptoms](#) in men whose previous history of mental health problems was limited to adolescence.

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Tables should be numbered and have an appropriate heading. The tables should be mentioned in the text but must not duplicate information. The heading of the table, together with any footnotes or comments, should be self-explanatory. The desired position of the table in the manuscript should be indicated. Do not tabulate lists, which should be incorporated into the text, where, if necessary, they may be displayed. Authors must obtain permission from the original publisher if they intend to use tables from other sources, and due acknowledgement should be made in a footnote to the table.

Statistics

Methods of statistical analysis should be described in language that is comprehensible to the numerate psychiatrist as well as the medical statistician. Particular attention should be paid to clear description of study designs and objectives, and evidence that the statistical procedures used were both appropriate for the hypotheses tested and correctly interpreted. The statistical analyses should be planned before data are collected and full explanations given for any *post hoc* analyses carried out. The value of test statistics used (e.g. *t*, *F*-ratio) should be given as well as their significance levels so that their derivation can be understood. Standard deviations and errors should not be reported as \pm but should be specified and referred to in parentheses.

Trends should not be reported unless they have been supported by appropriate statistical analyses for trends. The use of percentages to report results from small samples is discouraged, other than where this facilitates comparisons. The number of decimal places to which numbers are given should reflect the accuracy of the determination, and estimates of error should be given for statistics.

A brief and useful introduction to the place of confidence intervals is given by Gardner & Altman (1990, *Br J Psychiatry*, 156, 472-4). Use of these is encouraged but not mandatory.

Authors are encouraged to include estimates of statistical power where appropriate. To report a difference as being statistically significant is generally insufficient, and comment should be made about the magnitude and direction of change.

Commented [MOU6]: The percentage point difference to the previous one but is the same sample (N=25)

Nonetheless, a sizeable proportion reported new onset of depressive symptoms during the antenatal period; nearly one in three pregnancies where fathers reported mental health problems had no preconception history.

Nonetheless, 10 (31.9%, CI 14.4–49.4) of the 31 pregnancies during which men reported antenatal mental health problems had no prior history of preconception mental health problems. Men with a history of persistent preconception mental health problems from adolescence to young adulthood did not go on to experience mental health problems in 23 (72.1%, CI 55.3–88.9) of pregnancies.

Discussion

Our findings suggest that for many, mental health problems in the transition to parenthood are a continuation or recurrence of preconception problems. Expectant fathers with no history of mental health problems reported antenatal mental health problems in one in twenty pregnancies, while men with a history of mental health problems in adolescence and young adulthood reported antenatal mental health problems in one in four pregnancies. Nonetheless, a sizeable proportion reported new-onset of mental health problems during the antenatal period; nearly one in three pregnancies where fathers reported mental health problems had no preconception history. Conversely, nearly three quarters of those with persistent preconception mental health problems did not go on to report antenatal symptoms. Overall, men reported antenatal depressive symptoms for 10.5% of pregnancies, consistent with previous research (1).

Strengths of this study include the prospective two-generational design, and assessment of mental health at multiple time points across adolescence and young adulthood. Nonetheless, each assessment focused on the period immediately before interview, so we may have underestimated the proportion of those with antenatal mental health problems who had a prior history. Attrition and non-response may also have affected results. We used multiple imputation to address biases due to missing VAHCS data, but this would not have addressed the issue of differential recruitment to VHCS. Active VAHCS participants (83%) at VHCS commencement were more likely than those lost to follow-up to be Australian-born and have completed secondary school, though the two groups did not differ on prevalence of adolescent mental health problems. Of those who reported a pregnancy, VHCS participants (65% of men, 55% of pregnancies) did not differ from non-participants on mental health or socio-demographic variables at VHCS baseline (VAHCS Wave 9). Our sample size was small, and future investigation in a larger sample is warranted.

We have previously ~~found-reported~~ that ~~over 80% of~~ women with a history of mental health problems prior to conception ~~are-reported-at-increased-risk-for~~ perinatal ~~mental health problems~~ depressive symptoms (10). Findings from ~~and~~ the current study ~~indicates-suggest~~ that a ~~similarly sizeable proportion of men, over 60%, men~~ with a persistent or recent preconception history are ~~similarly~~ at risk going into pregnancy. ~~These findings align with previous reports that men's history of depression is a risk factor for postpartum disorder (3).~~ Our finding that one third of men with antenatal ~~mental health problems~~ depressive symptoms had no prior history ~~may be due in part to underestimation of preconception prevalence, but also~~ suggests that ~~this the antenatal~~ may be a ~~unique~~ time of heightened risk ~~too~~.

We also found that ~~the majority of~~ men with a history of preconception mental health problems did not go on to experience antenatal ~~mental health problems~~ depressive symptoms ~~for the majority of pregnancies~~. This may reflect the natural resolution of mental health problems for some men during young adulthood (5). It also suggests that other factors operating prior to or during pregnancy may mitigate risk for vulnerable men; for example, ~~previous research has indicated that~~ partner mental health ~~(REF)~~, relationship quality ~~(REF)~~ and social support ~~(REF) during the perinatal period are associated with men's mental health during this time~~.

~~Strengths of this study include the prospective two-generational design, and assessment of mental health at multiple time-points across adolescence and young adulthood. Nonetheless, each assessment focused on the period immediately before interview, so we may have underestimated the proportion of those with antenatal mental health problems who had a prior history. Nonetheless, a~~ Attrition and non-response may also have affected results. We used multiple imputation to address biases due to missing VAHCS data, but this would not have addressed the issue of differential recruitment to VIHCS. Active VAHCS participants (83%) at VIHCS commencement ~~were more likely than those lost to follow up to be Australian born and have completed secondary school, though the two groups did not differ on prevalence of adolescent mental health problems.~~

Of those who reported a pregnancy, VIHCS participants (65% of men, 55% of pregnancies) did not differ from non-participants on mental health or socio-demographic variables at VIHCS baseline (VAHCS Wave 9). Our sample size was small, and future investigation in a larger sample is warranted.

Our finding that most antenatal mental health problems were a continuation or recurrence of preconception problems suggests that men with a history of mental health problems would benefit from increased support going into pregnancy and across the perinatal period. Given that most men with mental health problems across adolescence and young adulthood did not go on to experience antenatal mental health problems, but that pregnancy was a time of heightened risk for men with no preconception history, future research identifying modifiable preconception and perinatal risk factors would provide targets for clinical and preventative intervention.

Table 1. Estimated associations between preconception continuity of common mental disorder and mental health problems in the third trimester of 295 pregnancies to 214 men.

Preconception mental health problems	Antenatal mental health problems									
					Unadjusted model			Adjusted model		
	N	n	%	(95% CI)	RR	(95% CI)	p	RR	(95% CI)	p
None	183	10	5.35	(1.98 - 8.72)	ref			ref		
Adolescent only	46	4	9.51	(0.35 - 18.67)	1.61	(0.48 - 5.36)	0.437	1.39	(0.41 - 4.64)	0.594
Young adult only	34	8	22.77	(7.34 - 38.21)	3.89	(1.38 - 10.98)	0.010	3.54	(1.28 - 9.76)	0.015
Adolescent and young adult	32	9	28.17	(11.24 - 45.09)	5.40	(2.18 - 13.35)	<0.001	4.48	(1.69 - 11.91)	0.003

Funding

This work was supported by the National Health and Medical Research Council [APP1008273, APP1063091, APP437015, APP1019887 to G.P., APP607351 to H.H., APP1046518 to M.W., and APP 491205 and APP1103976 to S.B.]; Australian Rotary Health; Colonial Foundation; Perpetual Trustees; Financial Markets Foundation for Children (Australia); Royal Children's Hospital Foundation; Murdoch Childrens Research Institute; Australian Postgraduate Award to E.S.; and the Australian Research Council [DP1311459 to C.O., DP110101036 to S.B.]. Research at the Murdoch Childrens Research Institute is supported by the Victorian Government's Operational Infrastructure Program.

Acknowledgements

The authors would like to thank the families who have participated in the Victorian Adolescent Health Cohort Study and the Victorian Intergenerational Health Cohort Study, and the study research team involved in the collection and management of VIHCS data.

About the authors

Text

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Appendices

Comparison of participants with non-participants

Details of imputation and complete case sensitivity analysis

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1. Paulson JF, Bazemore SD. Prenatal and postpartum depression in fathers and its association with maternal depression: a meta-analysis. *JAMA*. 2010;303(19):1961-9.
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- 1 Kapusta ND, Etzersdorfer E, Krall C, Sonneck G. Firearm legislation reform in the European Union: impact on firearm availability, firearm suicide and homicide rates in Austria. *Br J Psychiatry* 2007; **191**: 253-7.
 - 2 Thornicroft GJ. *Shunned: Discrimination Against People with Mental Illness*. Oxford University Press, 2006.
 - 3 Casey P. Alternatives to abortion and hard cases. In *Swimming Against the Tide: Feminist Dissent on the Issue of Abortion* (ed AB Kennedy): 86-95. Open Air Books, 1997.
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 - 6 Soni SD, Mallik A, Mbatia J, Shrimankar J. Late paraphrenia (letter). *Br J Psychiatry* 1988; **152**: 719-20.
 - 7 Viding E, Frick P, Plomin R. Aetiology of the relationship between callous-unemotional traits and conduct problems in childhood. *Br J Psychiatry* 2007; **190** (suppl 49): s33-8.
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