



Childhood sexual abuse and maternal social and financial resources, mental health, and parenting outcomes in pregnancy and early parenthood: a multicohort observational study

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Summary

Background Up to one in five women experience childhood sexual abuse (CSA) globally. Pregnancy and early parenthood might represent a time of heightened vulnerability for women who have experienced CSA. We aimed to describe disparities in social and financial resources, mental health, and parenting in pregnancy and early parenthood, between women reporting experience of CSA and women not reporting experience of CSA.

Methods This multicohort observational study included data from three longitudinal, population-based, preconception cohorts, two in Australia and one in New Zealand. The Victorian Intergenerational Health Cohort Study (VIHCS) included 398 women with 609 children; the Australian Temperament Project Generation 3 (ATPG3) included 400 women with 697 children; and The Dunedin Multidisciplinary Health and Development Study–Parenting Study (Dunedin-PS) included 361 women with 361 children. Women aged 23–26 years reported on various experiences of CSA occurring before age 16 years, with measures varying in restrictions by perpetrator characteristics, included acts, and measure length. Participants were then assessed during subsequent pregnancies and early parenthood on mental health, parenting, and social and financial resources. Linear regression models were used to calculate standardised β coefficients for each outcome in each cohort.

Findings The reported prevalence of CSA before age 16 years was 60 (15%) of 393 in VIHCS, 23 (7%) of 332 in ATPG3, and 113 (31%) of 361 in Dunedin-PS. In all cohorts, women reporting experience of CSA had increased social and mental health risks (eg, depressive symptoms and partner coercive control), and reduced protective factors (eg, income, social support, partner relationship quality) during pregnancy and early parenthood compared with those not reporting experience of CSA. β coefficients were largest and most consistent for social support (VIHCS 1 year postpartum: β -0.61 [95% CI -0.87 to -0.35]; ATPG3 1 year postpartum: β -0.52 [-0.94 to -0.10]; and Dunedin-PS 3 years postpartum: β -0.43 [-0.65 to -0.22]). Associations with parenting were generally small to null, and less consistent across studies.

Interpretation In our multicohort observational study, women reporting experience of CSA had increased mental health risks during pregnancy and early parenthood, as well as substantially lower levels of social protective factors for maternal and child health, compared with women not reporting experience of CSA. As previously neglected intervention targets, these social resources might be particularly important foci within trauma-informed clinical care guidelines for women who have experienced CSA, to buffer risks for women and their children.

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Introduction

Up to one in five women have experienced childhood sexual abuse (CSA) globally,¹ with long-term effects on psychological health and functional outcomes.² Across the life course, pregnancy and early parenthood are recognised as times of heightened vulnerability to traumatic recollection and resurgence of symptomology for women who have experienced CSA.³ As such, this window is crucial for the intergenerational transmission

of trauma, with potentially enduring effects on fetal and infant development.⁴ Given that pregnancy and early parenthood is also a period of uniquely frequent health-care system contact, it might also provide opportunities for maternal healing and disruption of intergenerational transmission pathways.⁵

Despite this background, little clinical guidance is available on pregnancy and early parenthood care and support options for women who have experienced CSA.

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Research in context

Evidence before this study

We searched PubMed, MEDLINE (EBSCO), and Google Scholar from database inception to June 8, 2025, for publications in English using the search terms (“childhood sexual abuse” OR “CSA”) AND (“perinatal” OR “antenatal” OR “postnatal” OR “parenthood”) AND “partner relationship” OR “coercive control” OR “income” OR “depress*” OR “anxiety” OR “stress*” OR “social support” OR “parenting”) AND (“longitudinal” OR “prospective”). We identified studies showing associations between childhood sexual abuse (CSA; recalled during pregnancy or early childhood of offspring) and perinatal depression and anxiety, parenting, or intimate partner violence. We found no longitudinal studies describing the extent to which women who have experienced CSA are at increased risk of a range of adverse social and financial, mental health, and parenting outcomes in pregnancy and early parenthood.

Added value of this study

Our multicohort observational study used data from three long-standing population-based preconception cohorts in Australia and New Zealand. We describe the disparities in a

range of financial and social resources, maternal mental health, and parenting outcomes in pregnancy and early parenthood, between women who have experienced CSA and women who have not experienced CSA.

Implications of all the available evidence

Women who have experienced CSA face an elevated burden of mental health symptoms and depleted social support resources in pregnancy and early parenthood. In turn, these factors can compromise women’s ongoing wellbeing, family functioning, and child development. However, clinical guidance and tailored interventions for the perinatal care of women who have experienced CSA remain scant and primarily centred on maternal health and behaviour. Our findings support calls for trauma-informed pre-pregnancy and perinatal interventions that extend beyond individual determinants of health to include broader aspects of social wellbeing. Such strategies might offer a path to both improve outcomes for women who have experienced CSA and, in doing so, also reduce the potential for intergenerational transmission of trauma.

Many existing guidelines and interventions focus on individual-level factors, such as women’s health and parenting behaviour, rather than the wider socioecological context that could affect people who have experienced CSA and their families.⁶ This focus mirrors that in previous research, which links CSA to increased risk of perinatal depressive symptoms and parenting difficulties.^{5,7} Such a focus centres maternal behaviour as a key vector in intergenerational transmission of trauma; in so doing, it fails to consider the broader experience of pregnancy and parenthood for women who have experienced CSA, including the social and structural context that shapes both maternal wellbeing and children’s development.

By contrast, trauma-informed approaches emphasise the importance of considering the sequelae of childhood abuse within a socioecological context.⁵ CSA might reflect an environment of cumulative adversity, given that adverse childhood experiences often co-occur,⁸ or disrupt development of and access to supportive connections with others.⁹ Therefore, financial and social risks in early parenthood might be greater in people who have experienced CSA and represent key pathways through which negative intergenerational cycles might perpetuate. These pathways also represent potential intervention targets that expand the focus of attention beyond the mental health and behaviour of mothers.

The primary aim of our study was to describe the extent to which women who have experienced CSA are at increased risk in the transition to parenthood and might, therefore, warrant the prioritisation of further policy and clinical attention. Specifically, we aimed to describe

disparities in social and financial resources, maternal mental health, and parenting in pregnancy and early parenthood in women who have experienced CSA compared with women who have not experienced CSA. As a secondary aim, we examined the potential causal contribution of CSA to such disparities.

Methods

Study design and participants

This multicohort observational study included data from three longitudinal, population-based, preconception cohorts—two from Australia and one from New Zealand. The studies span preconception to next-generation parenthood and were designed to examine how the life histories of parents contribute to disparities in family health and functioning and to identify intervention targets to reduce intergenerational transmission of disadvantage.

The Victorian Intergenerational Health Cohort Study (VIHCS)¹⁰ is an ongoing prospective study of children born to participants in the Victorian Adolescent Health Cohort Study (VAHCS), which is a 34-year, 11-wave, population-based cohort study. The VAHCS cohort study started in 1992, and 1943 adolescents who were attending secondary schools in Victoria, Australia (1000 of whom were female), were recruited at a mean age of 15.25 years (SD 0.59) via a two-stage cluster-sampling design. Between September, 2006, and June, 2013, participants in VAHCS were aged 29–36 years, encompassing the median parental age for Australian births, and were screened every 6 months for pregnancy via text message, email, and telephone.

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Those reporting pregnancy or recent birth were invited to complete VIHCS assessments in trimester three and at 2 months and 1 year postpartum. Guardians of participants in VAHCS provided written informed consent at recruitment. Participants in VAHCS provided informed consent at subsequent waves. Participant gender and country of birth were self-reported. Protocols for VIHCS and VAHCS were approved by the Royal Children's Hospital Human Research Ethics Committee (approval numbers 33168 and 26032), Victoria, Australia.

Australian Temperament Project Generation 3 (ATPG3)¹¹ is an ongoing prospective study of children born to participants of the Australian Temperament Project (ATP), which is a 43-year, 17-wave (17th wave ongoing), population-based cohort study that started in 1983. 2443 infants (1168 of whom were female) were recruited to ATP at age 4–8 months through maternal and child health centres in 20 urban and 47 rural local government areas in Victoria, Australia. Characteristics of the ATP sample accorded with typical Australian demographics at the time.¹¹ Between 2011 and 2018, participants in ATP were aged 29–36 years and were screened for pregnancies via email or telephone every 6 months. Those reporting pregnancy or recent birth were invited to complete ATPG3 assessments in trimester three and at 2 months and 1 year postpartum. Parents of participants in ATP provided informed consent from waves 1 to 7. Participants in ATP provided informed consent at subsequent waves. Participant gender was self-reported, as was the country of birth of the parent of the participant. Protocols for ATP and ATPG3 were approved by the Royal Children's Hospital Human Research Ethics Committee (current approval numbers 100156 and 34185), Victoria, Australia.

The Dunedin Multidisciplinary Health and Development Study–Parenting Study¹² (Dunedin-PS) is a prospective study of children born to participants of a 54-year, 14-wave, population-based cohort study called the Dunedin Multidisciplinary Health and Development Study (DMHDS), which started in 1972.^{13,14} 1037 children in the DMHDS (502 [48.4%] of whom were female) were assessed at age 3 years (an unselected cohort that was representative of the population of the South Island of New Zealand). Between July, 1994, and November, 2018, participants in the DMHDS were aged 21–46 years and were routinely screened to identify whether they had become a parent. Participants with children were invited to participate in Dunedin-PS assessments when their child was 3 years of age. Protocols for the DMHDS and Dunedin-PS were approved by the New Zealand Health and Disability Ethics Committee and Lower Regional South Health and Disability Ethics Committee (current approval numbers H23/034 and LRS1081071029). Participants in the DMHDS and, in earlier phases, their parents, provided written informed consent for all assessments. Participants also consented on behalf of their children

as part of the Dunedin-PS consent process. In Dunedin-PS, participant sex assigned at birth was recorded and ethnicity was self-reported.

Procedures

In each cohort, young adult women (aged 23–26 years) reported on experiences of CSA before age 16 years. The definition and measurement of CSA varied across cohorts (table 1; appendix pp 3–6), reflecting the broader literature in which definitional frameworks and measures vary by regulatory and policy settings as well as by considerations regarding potential retraumatisation.^{1,27,28} These variations include restrictions on perpetrator characteristics, included acts, measure length, and extent of prompting regarding experience of specific acts.

For pregnancy and early parenthood outcomes, women reported on indicators of social and financial resources, mental health, and parenting either antenatally or at 1 year postpartum (or both antenatally and at 1 year postpartum) for each infant in the VIHCS and ATPG3 cohorts, and during early childhood (age 3 years) for each child in the Dunedin-PS cohort (table 1; appendix pp 3–6). For each outcome, mean or total scale scores were standardised, with high scores denoting high levels of each construct.

We identified indicators of family-of-origin socioeconomic disadvantage, household dysfunction, and other childhood adversities that can co-occur with CSA and represent potential risk factors for the outcomes. Available covariates were included in multivariable models to answer our secondary causal research aim. For VIHCS and ATPG3, these covariates were: non-completion of high-school by the mothers' parents, separation or divorce, death, heavy drinking, area-level socioeconomic disadvantage, and emotional neglect. For Dunedin-PS, these covariates were: mothers' childhood socioeconomic status, household dysfunction (incarceration of a family member, and household substance misuse, mental illness, loss of a parent, or intimate partner violence), and other adverse childhood experiences (physical abuse, emotional abuse, physical neglect, and emotional neglect; appendix pp 3–6).

Statistical analysis

Participant characteristics were summarised for each cohort as mean (SD) for continuous variables, and frequencies and percentages for categorical variables. For our primary aim—which was to describe disparities in social and financial resources, maternal mental health, and parenting experiences in pregnancy and early parenthood between women who had experienced CSA and women who had not experienced CSA—we estimated unadjusted associations between CSA and each outcome. Following principles of descriptive epidemiology, confounder adjustment was not applied to preserve disparities between exposure groups as they exist in the population.²⁹ For our secondary aim—to examine the potential causal contribution of CSA to such

See Online for appendix

	VIHCS	ATPG3	Dunedin-PS
Exposure measure			
CSA	CSA was assessed using a six-item prompted measure restricted to adult perpetrators and a set of specific contact and non-contact acts. Participants indicated via computer-assisted telephone interview, at age 24 years, whether they had experienced each of the following unwanted contact before age 16 years, from an adult or older person: being asked to engage in sexual acts, touching private parts, attempted or actual intercourse, kissing or hugging in a sexual way, and flashing. CSA was defined as any unwanted sexual incidents. ¹⁵	CSA was assessed using a three-item non-prompted measure relating to any unwanted acts or acts with a family member. Items were administered via computer-based questionnaire, at age 23–24 years. CSA was defined as any non-consensual sexual experience with a non-family member or any sexual experience with a family member, before age 16 years.	CSA was assessed using a prompted measure including five stem items and branched follow-up questions, with no restrictions to perpetrator or included acts. Participants indicated via computer-based questionnaire, at age 26 years, whether they had experienced each of the following unwanted contact before age 16 years: genital touching, attempted or actual intercourse, and other unwanted contact or non-contact sexual experiences (eg, oral sex or flashing). CSA was defined as any unwanted sexual incidents.
Outcome measures			
Household income	One item assessing annual pretax household income in Australian dollars (pregnancy and postpartum)	One item assessing weekly after-tax household income in Australian dollars (postpartum)	One item assessing annual pretax household income in New Zealand dollars (early childhood)
Social support	Maternity Social Support Scale ¹⁶ (pregnancy and postpartum)	Maternity Social Support Scale ¹⁶ (pregnancy and postpartum)	12 items from the Significant Others Scale ¹⁷ (early childhood)
Partner coercive control	Maternity Social Support Scale—Coercive Control subscale ¹⁸ (pregnancy and postpartum)	Maternity Social Support Scale—Coercive Control subscale ¹⁸ (pregnancy and postpartum)	NA
Partner relationship quality	Seven items from the Dyadic Adjustment Scale ¹⁹ (pregnancy)	Seven items from the Dyadic Adjustment Scale ¹⁹ (pregnancy)	The Partner Relationships Scale ^{22,20} (early childhood)
Depressive symptoms	Edinburgh Postnatal Depression Scale ²¹ (pregnancy and postpartum)	Edinburgh Postnatal Depression Scale ²¹ (pregnancy and postpartum)	The Malaise Inventory ²² (early childhood)
Hostile, warm, and anxious parenting	15 items from LSAC ²³ (postpartum)	15 items from LSAC ²³ (postpartum)	Nine items from the Child Rearing Practices Report ²⁴ (early childhood)
Parenting self-efficacy	Four items from LSAC ²³ (postpartum)	One item from LSAC ²³ (postpartum)	NA
Parent–infant bond	Postpartum Bonding Questionnaire ²⁵ (postpartum)	Maternal Postnatal Attachment Scale ²⁶ (postpartum)	NA

CSA=childhood sexual abuse. LSAC=Longitudinal Study of Australian Children. NA=not assessed.

Table 1: Measures of CSA and maternal outcomes in pregnancy, postpartum, and offspring in early childhood

disparities—we used multivariable regression as the confounding adjustment method.

Antenatal and postpartum outcomes were assessed in VIHCS and ATPG3 at the same timepoints, using identical or similar measures. Therefore, for these outcomes, we present both pooled and cohort-specific estimates. Generalised estimating equations with an identity link, Gaussian distribution, and exchangeable correlation structure were used to account for clustering by family, as some women contributed data for more than one pregnancy. Pooled models included a cohort indicator to account for between-cohort differences. Maternal outcomes in children in early childhood (age 3 years) were assessed in the Dunedin-PS cohort, using different measures to the other two cohorts, and were therefore analysed separately. Generalised linear models were used as there was no within-family clustering. All associations are reported as standardised β coefficients and 95% CIs. We focused our interpretation on the direction and magnitude of coefficient values and their public health relevance, rather than statistical significance. Therefore, we did not adjust for multiple comparisons.

In Dunedin-PS, all variables had less than or equal to 1% missing data. Therefore, for this cohort, available case analysis was performed. In VIHCS and ATPG3,

missing data on variables were low to moderate. In these cohorts, multiple imputation under fully conditional specification was used to create 65 imputed datasets, reflecting the proportion of participants with missing data in at least one variable, separately for each cohort. Parameter estimates were obtained by pooling results across imputed datasets using Rubin's rules. Further details on missing data and the imputation procedure are in the appendix (pp 7–9). In sensitivity analyses, we repeated the primary analyses using available case data for VIHCS and ATPG3.

We used Stata 18 for data cleaning and analyses. Figures were created using R (version 3.6.3), RStudio (version 2022.2.0.443). References for statistical analyses and programs are in the appendix (p 10). We followed STROBE reporting guidelines (appendix pp 11–12).

Role of the funding source

The funders of this study did not have any role in the study design, data collection, data analysis, data interpretation, or writing of the report.

Results

The analysis sample included 398 women in VIHCS with 609 children, 400 women in ATPG3 with 697 children, and 361 women in Dunedin-PS with

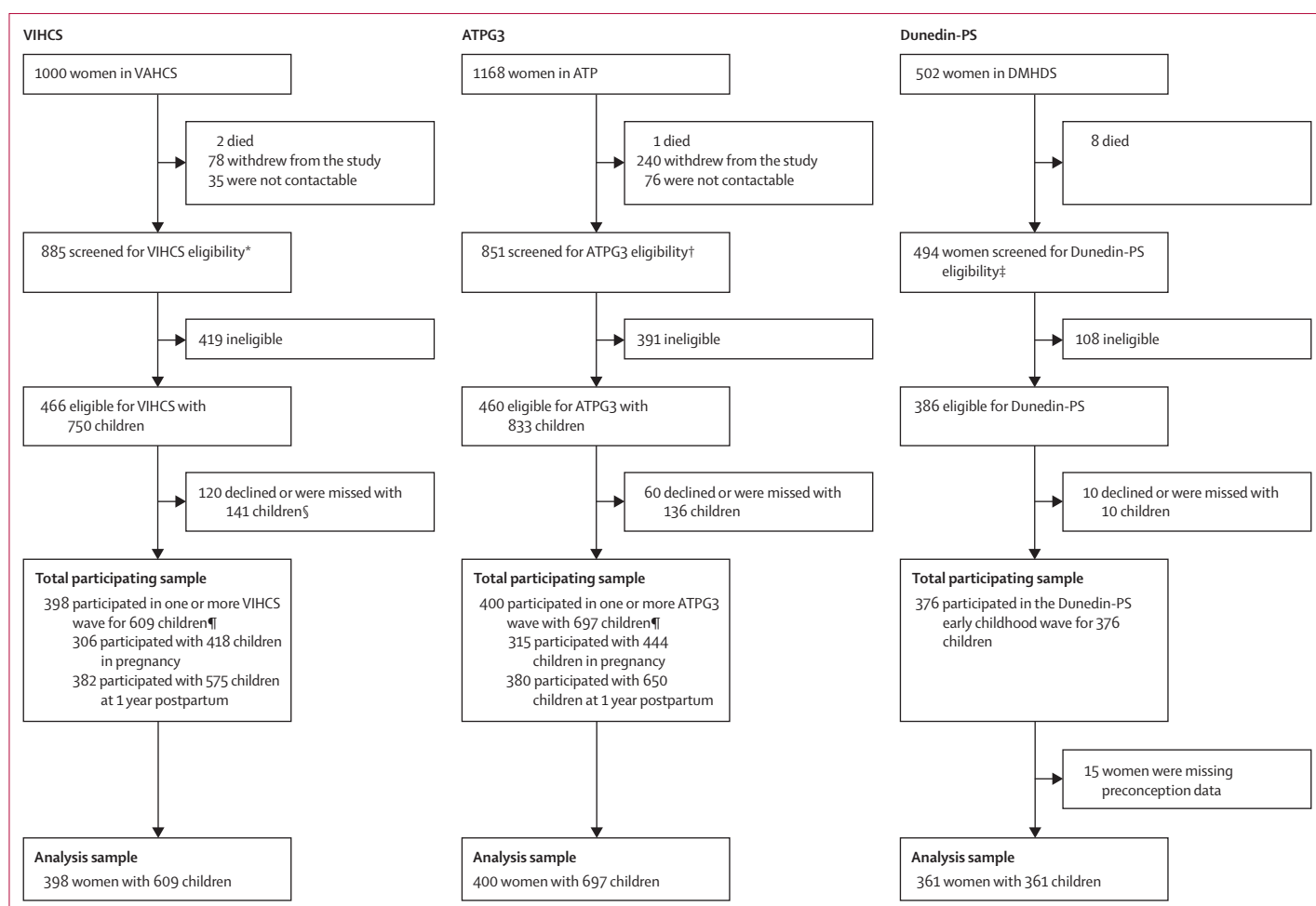


Figure 1: Sampling and ascertainment of the three included cohorts

ATP=Australian Temperament Project. ATPG3=Australian Temperament Project Generation 3. DMHDS=Dunedin Multidisciplinary Health and Development Study. Dunedin-PS=Dunedin Multidisciplinary Health and Development Study-Parenting Study. VAHCS=Victorian Adolescent Health Cohort Study. VIHCS=Victorian Intergenerational Health Cohort Study. *VIHCS eligibility defined as all livebirths occurring during screening (September, 2006, to June, 2013). †ATPG3 eligibility defined as all children younger than 18 months identified during screening (December, 2011, to September, 2018). ‡Dunedin-PS eligibility defined as DMHDS having a parenting role with their child aged between 36 and 60 months (July, 1994, to November, 2018). §Of the 120 women in VAHCS who did not participate for one or more eligible children in VIHCS, 68 were excluded and the remaining women were recruited to participate in the study with one or more other child. ¶In each of VIHCS and ATPG3, many parents participated with more than one child born during the recruitment phase.

361 children (figure 1). Little difference was noted between baseline and analysis samples for most measured characteristics (appendix p 13), although rates of grandparental high-school non-completion were lower in the ATPG3 analysis sample than in the original sample recruited into ATP (103 [26%] of 399 vs 403 [35%] of 1144).

Mothers' characteristics, and proportions of missing data, are shown in table 2 (for VIHCS and ATPG3) and table 3 (for Dunedin-PS). The reported prevalence of CSA before age 16 years was 60 (15%) of 393 in VIHCS, 23 (7%) of 332 in ATPG3, and 113 (31%) of 361 in Dunedin-PS. Characteristics of CSA in each cohort, where reported, are in the appendix (p 14). Preconception characteristics of the VIHCS and ATPG3 samples were mostly similar. In the Dunedin-PS, one in four mothers had experienced childhood physical or emotional abuse or neglect, and half had experienced household

dysfunction. In all cohorts, rates of assessed childhood adversities were mostly higher in those reporting CSA than in those not reporting CSA (appendix p 15).

Maternal outcomes in pregnancy and at 1 year postpartum in women reporting experience of CSA compared with women not reporting experience of CSA in VIHCS and ATPG3 are shown in figure 2. Overall, in pooled data, consistent evidence was shown of disparities in all social, financial, and mental health outcomes, and weaker or less consistent evidence of disparities in parenting experiences. The direction and size of point estimates was generally similar across cohorts.

Of the social and financial outcomes, the greatest disparities were observed for social support. Women who had experienced CSA reported receiving substantially less social support than did women who

had not experienced CSA (pooled antenatal β -0.46 [95% CI -0.69 to -0.22]; pooled postpartum β -0.60 [-0.83 to -0.38]; figure 2). Greater partner coercive control and relationship difficulties, and lower household income, were also reported for women reporting CSA compared with women not reporting CSA. The direction and size of point estimates was similar across cohorts.

With respect to mental health outcomes, women who had experienced CSA reported higher depressive symptoms relative to women who had not experienced CSA (pooled antenatal β 0.48 [95% CI 0.23 – 0.73]; pooled postpartum β 0.34 [0.12 – 0.57]; figure 2). The direction of associations was consistent across cohorts, although evidence was stronger in VIHCS than in ATPG3.

Associations of CSA with parenting outcomes were generally weakest and least consistent compared with social and financial and mental health outcomes. The strongest evidence for an association with CSA was observed for anxious parenting, with higher rates in women who had experienced CSA than in women who had not experienced CSA (pooled β 0.35 [95% CI 0.13 – 0.58]; figure 2). Also, evidence was shown of reduced parent–infant bonding in women reporting CSA compared with women not reporting CSA, although the coefficient magnitude was less consistent across cohorts. Associations between CSA and parental self-efficacy or hostile parenting were close to null.

Figure 3 shows maternal outcomes during the early childhood of their offspring (ie, age 3 years) for women in Dunedin-PS who had experienced CSA and those who had not experienced CSA. Overall, the direction of point estimates was similar to those in VIHCS and ATPG3. The strongest evidence for an association with CSA was observed for social support. Women who had experienced CSA reported receiving insufficient support overall, and relative to the amount of support wanted, compared with women who had not experienced CSA (overall β -0.43 [95% CI -0.65 to -0.22]; relative β -0.33 [-0.55 to -0.11]; figure 3). Women reporting CSA were also at increased risk of reduced positive partner relationships, compared with women not reporting CSA. Some evidence was reported of lower household income for women who had experienced CSA than for women who had not experienced CSA, although the 95% CIs were wide. Depressive and anxious symptoms were also higher in women reporting CSA compared with women not reporting CSA (β 0.24 [0.03 to 0.46]). Little evidence was found for an association between CSA and maternal parenting outcomes.

In the Dunedin-PS study, associations with CSA were also evaluated by source of support (figure 4). Women who had experienced CSA reported both wanting less support from their family and partners and receiving less support than they wanted, compared with women who had not experienced CSA. No evidence was shown of associations between CSA and support from friends.

	VIHCS (n=398 women with 609 children)		ATPG3 (n=400 women with 697 children)	
	Mean (SD) or n (%)	Proportion missing	Mean (SD) or n (%)	Proportion missing
Maternal characteristics				
Age at child's birth, years	32.3 (1.8)	0%	31.6 (2.6)	0%
Participant parents' high-school non-completion*	152/393 (39%)	1%	103/399 (26%)	0%
Area-level disadvantage	103/395 (26%)	1%	83/378 (22%)	6%
Participant parents' separation or divorce*	64/397 (16%)	0%	65/385 (17%)	4%
Participant parents' death*	9/397 (2%)	0%	10/348 (3%)	13%
Participant parents' emotional neglect*	11/326 (3%)	18%	6/332 (2%)	17%
Participant parents' heavy drinking*	38/341 (11%)	14%	81/332 (25%)	19%
Region of birth†	..	8%	..	<1%
Oceania	334/368 (91%)	..	373/398 (94%)	..
Europe	9/368 (2%)	..	93/398 (23%)	..
Asia, Africa, and the Americas	25/368 (7%)	..	7/398 (2%)	..
Childhood sexual abuse				
Any childhood sexual abuse	60/394 (15%)	1%	23/332 (7%)	17%
Antenatal and postpartum outcomes‡				
Postpartum household income, AU\$	\$93 798 (46 336)	40%	\$91 246 (54 105)	11%
Antenatal social support	4.6 (0.4)	32%	4.6 (0.4)	37%
Postpartum social support	4.4 (0.6)	5%	4.4 (0.5)	9%
Antenatal partner coercive control	1.4 (0.5)	32%	1.5 (0.5)	37%
Postpartum partner coercive control	1.6 (0.6)	7%	1.7 (0.6)	9%
Partner relationship quality	4.3 (0.4)	33%	4.3 (0.3)	38%
Antenatal depressive symptoms	4.7 (3.6)	31%	5.4 (3.9)	37%
Postpartum depressive symptoms	4.2 (3.8)	6%	4.4 (3.7)	16%
Postpartum parental warmth	4.4 (0.5)	6%	4.5 (0.4)	7%
Postpartum hostile parenting	1.8 (0.5)	6%	1.9 (0.5)	7%
Postpartum anxious parenting	3.1 (0.7)	6%	3.1 (0.6)	7%
Postpartum parental self-efficacy	4.3 (0.5)	6%	3.2 (0.7)	7%
Postpartum parent–infant bond	4.6 (0.3)	5%	4.3 (0.3)	7%

Maternal characteristics and childhood sexual abuse are summarised by parent, and outcomes are summarised by offspring. Proportions (n/N) represent the percentage with the specified level of the variable; denominators (N) vary by variable due to missing data. Proportion missing are calculated using the total sample size for each intergenerational cohort. Mean units are unstandardised units. Details regarding variable derivation are in the appendix (pp 3–6). We assessed disclosure risk using observed frequencies, and aggregated categories with low cell counts. ATPG3=Australian Temperament Project Generation 3. VIHCS=Victorian Intergenerational Health Cohort Study. *Participant parent refers to the parents of the women who participated in each of the generational studies. †For VIHCS, participants' countries of birth were coded into regions according to the Standard Australian Classification of Countries. For ATPG3, countries of birth for participants' parents were coded into regions using the same classification, as it was a birth cohort and thus all participants were born in Australia. In ATPG3, each region represents one or both parents being born in that region; therefore, the percentages do not total 100%. All country of birth data were reported by participants (VIHCS) and participants' parents (ATPG3). ‡Outcomes were either mean or total score. Outcomes are coded in the direction of high scores denoting high levels of each construct. Social support, partner coercive control, parental warmth, hostile parenting, anxious parenting, and parental self-efficacy are mean scores (range 1–5). Depressive symptoms is a total score (range 0–30). Parent–infant bond is a mean score (range 0–5).

Table 2: Characteristics of participants in VIHCS and ATPG3

After adjusting for potential confounding variables, the pattern of associations between CSA and pregnancy or early parenthood outcomes was mostly similar to those in

	Mean (SD) or n (%)	Proportion missing
Maternal characteristics		
Age at child's birth, years	28.7 (6.0)	0%
Childhood socioeconomic status	3.7 (1.1)	0%
Ethnicity*	..	0%
Māori	29 (8%)	..
New Zealand European	325 (90%)	..
Other	7 (2%)	..
Household dysfunction adverse childhood experiences	..	0%
Zero harms	168 (47%)	..
One harm	121 (34%)	..
Two or more harms	72 (20%)	..
Child harm adverse childhood experiences	..	0%
Zero harms	278 (77%)	..
One harm	64 (18%)	..
Two or more harms	19 (5%)	..
Childhood sexual abuse		
Any childhood sexual abuse	113 (31%)	0%
Maternal outcomes in offspring early childhood		
Household income, NZ\$	\$65 734 (27 738)	1%
Received social support	5.5 (0.8)	0%
Ideal social support	6.3 (0.6)	1%
Received-ideal support discrepancy	-0.8 (0.6)	1%
Positive partner relations	5.8 (2.6)	0%
Negative partner relations	2.6 (1.5)	0%
Depression and anxiety symptoms	0.2 (0.1)	0%
Parental warmth	6.7 (0.4)	0%
Hostile parenting	2.1 (0.9)	0%
Anxious parenting	3.1 (0.8)	0%
Proportions (n/N) represent the percentage with the specified level of the variable. Mean units are unstandardised units. Details regarding variable derivation are in the appendix (pp 3–6). We assessed disclosure risk using observed frequencies, and aggregated categories with low cell counts. Outcomes are coded in the direction of high scores denoting high levels of each construct. Ranges were: 1–6 (socioeconomic status), 1–7 (social support), 1–9 (partner relations), 0–1 (depression and anxiety symptoms), and 1–7 (parental warmth, hostile parenting, and anxious parenting). Dunedin-PS=Dunedin Multidisciplinary Health and Development Study-Parenting Study. *Ethnicity was self-reported by participants.		
Table 3: Characteristics of participants in Dunedin-PS (n=361 women with 361 children)		

the unadjusted analysis (appendix pp 16–17). Estimates were generally directionally consistent across the cohorts, with some heterogeneity in effect sizes. Overall, the strongest adjusted associations were observed for lower social support. Also, women reporting CSA were at increased risk of partner coercive control, and of lower positive partner relationships, compared with women not reporting CSA. Evidence of an effect of CSA on income was weaker than for other outcomes. Of the mental health and parenting outcomes, the largest effect sizes were observed in pregnancy and postpartum for depressive

symptoms, anxious parenting, and the parent–infant bond, although these associations attenuated somewhat during the early childhood of their offspring. Evidence of an effect of CSA on other parenting outcomes was weak. In the sensitivity analyses in VIHCS and ATPG3, in which primary analyses were conducted using imputed data, the direction and strength of point estimates were similar in the available case analyses (appendix p 18).

Discussion

We analysed data from three Australasian, population-based, preconception cohorts to describe disparities in social and financial, mental health, and parenting outcomes during pregnancy and early parenthood for women who had experienced CSA. Overall, our findings highlight that women reporting CSA might face increased challenges on many fronts. Women who had experienced CSA reported higher levels of most risks in pregnancy and early parenthood (eg, coercive control and depressive symptoms) and lower levels of most protective factors (eg, income, social support, partner relationship, and parent–infant bond) than did women who had not experienced CSA. Stronger and more consistent evidence was available for associations with social and mental health outcomes than for parenting outcomes. After adjustment for other early life disadvantage and adversities, associations with social and mental health outcomes remained strongest.

CSA rates varied, reflecting well documented challenges in defining and measuring CSA.^{1,27} For example, although recent meta-analytical estimates of CSA rates for Australia and New Zealand were 29.0% and 25.5%, individual Australian study rates ranged from 6.8% to 37.3%.²⁸ Our heterogeneity aligns with previous research: the highest rates of CSA were observed in Dunedin-PS (31%, assessed with a prompted measure and no restrictions to perpetrator or acts), followed by VIHCS (15%, assessed with a prompted measure and restriction to adult perpetrators and specific acts), then ATPG3 (7%, assessed with a brief measure, likely capturing only the most severe cases). This variation could also reflect sample differences, including potential epoch effects.²⁸ Most importantly, despite this variation, women reporting CSA consistently experienced poorer outcomes during pregnancy and early parenthood.

Our primary interest was in describing financial, social, mental health, and parenting disparities between women who had experienced CSA and women who had not experienced CSA. Overall, findings support an expansion to include the social context when looking at what might improve outcomes for women reporting CSA, and their families. The greatest disparities were observed for social support: women who had experienced CSA reported substantially fewer support resources as they transitioned to parenthood. These differences were evident within partner and family relationships rather than the peer network, which might reflect a potentially key source of

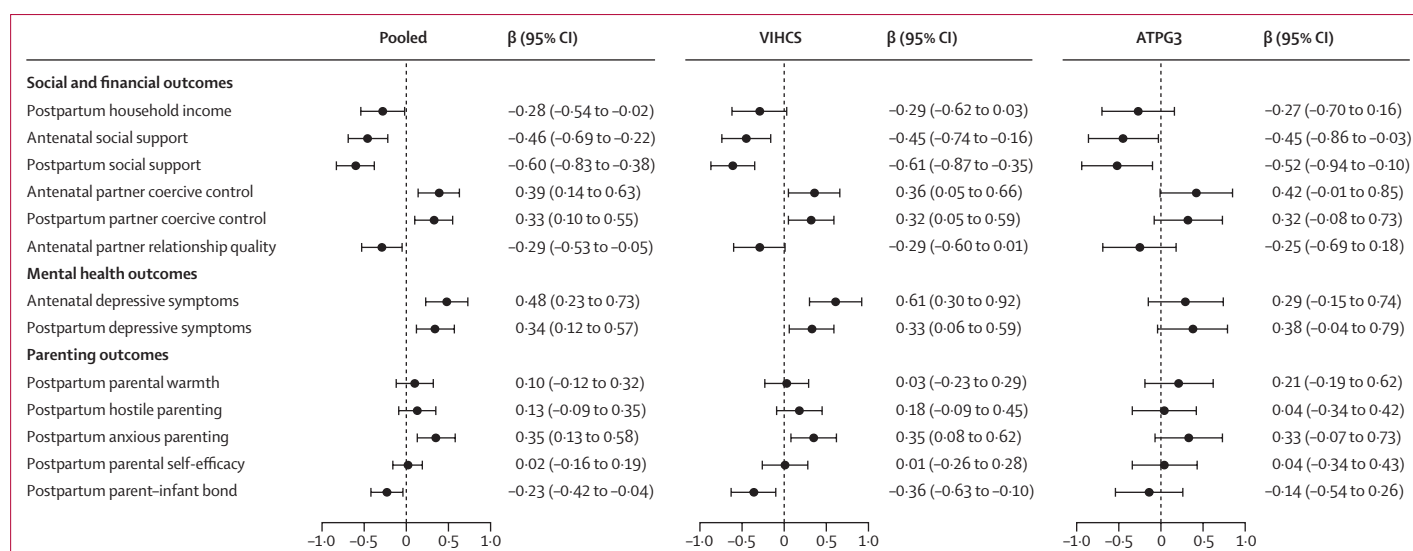


Figure 2: Associations between childhood sexual abuse and maternal perinatal outcomes, in VIHCS and ATPG3

The two cohorts included a combined 798 women with 1306 infants. Unadjusted associations are presented as β coefficients with error bars showing 95% CIs. Estimates were obtained from multiply imputed datasets. All outcomes are standardised continuous variables, where high scores denote high levels of each named construct. ATPG3=Australian Temperament Project Generation 3. VIHCS=Victorian Intergenerational Health Cohort Study.

resilience. Women who had experienced CSA also reported greater coercive control by partners. In turn, social support and coercive control can profoundly affect women's and children's health.^{30,31} Importantly, our measures reflect individuals' own perceptions of social support, relative to their needs. Perceived support shows consistent associations with positive health and wellbeing;³² our findings highlight the importance of further qualitative research and intervention co-design, to ensure that planned supports meet the specific needs of women who have experienced CSA.

Depressive and anxiety symptoms in pregnancy and early parenthood were also higher in women who reported CSA, relative to those who did not. This finding is consistent with previous meta-analytical evidence linking CSA with mental health risk across adulthood,² and with results of cross-sectional studies of CSA and perinatal depression.⁷ We further found that women who had experienced CSA had heightened parenting anxiety in the transition to parenthood (VIHCS and ATPG3), but this association might attenuate across the first 3 years of their children's life (Dunedin-PS) as women establish their own pathways and identities as parents. This possibility provides a sense of hope and is worth exploring in future research.

We found no evidence that women who had experienced CSA lack warmth or connectedness with their infant (other than in VIHCS, in which the bonding measure included parenting anxiety), or confidence in their parenting. Although our measures reflected the women's experience and the bond they felt with their infant, findings are also consistent with a prospective study showing no evidence of observed parenting

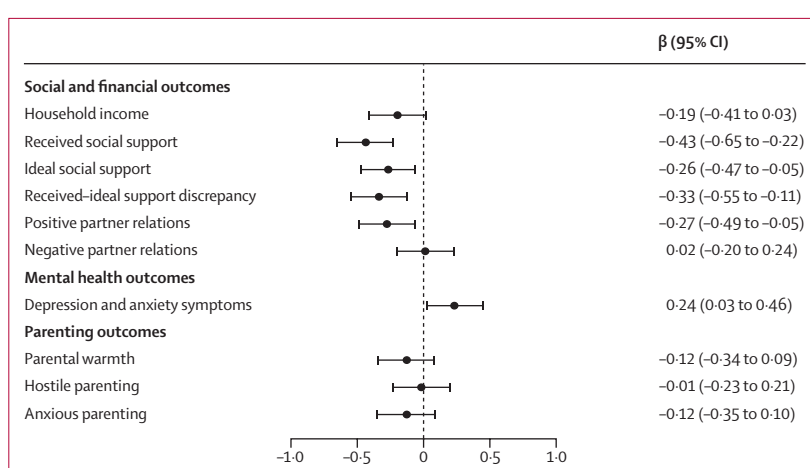


Figure 3: Associations between childhood sexual abuse and maternal outcomes during offspring early childhood, in Dunedin-PS

Dunedin-PS included 361 women with 361 infants. Unadjusted associations are shown as β coefficients with error bars showing 95% CIs. Estimates were obtained from observed data. Maternal outcomes were assessed when children were aged 3 years. All outcomes are standardised continuous variables, where high scores denote high levels of each named construct. Dunedin-PS=Dunedin Multidisciplinary Health and Development Study-Parenting Study.

difficulties in women who have experienced CSA.³³ These might be important findings for women with experience of CSA, for whom a fear of judgement might be a barrier to disclosure and access to support.³

In secondary analyses, we evaluated the potential causal contribution of CSA to each outcome. These findings are preliminary, given the observational design of our study, but provide initial evidence on the extent to which preventing CSA might reduce social and mental health disparities in pregnancy and early parenthood. Overall, evidence consistent with a potential causal effect

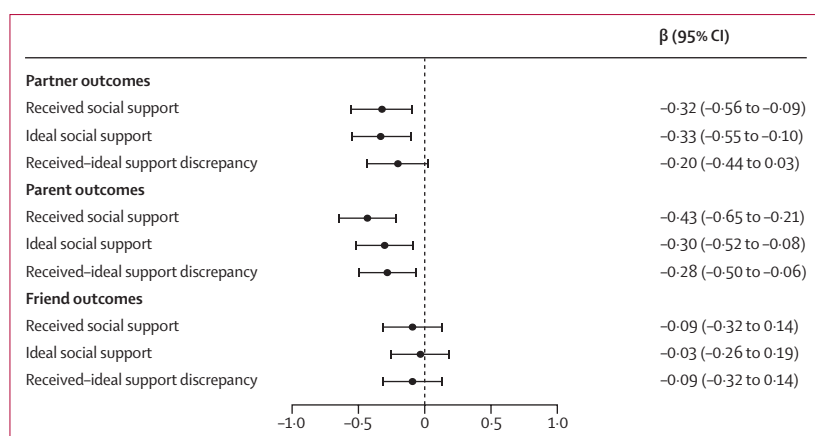


Figure 4: Associations between childhood sexual abuse and maternal social support during offspring early childhood, by source of support, in Dunedin-PS

Dunedin-PS included 361 women with 361 infants. Unadjusted effect estimates are shown as β coefficients with error bars showing 95% CIs. Estimates were obtained from observed data. Maternal outcomes were assessed when children were aged 3 years. All outcomes are standardised continuous variables, where high scores denote high levels of each named construct. Dunedin-PS=Dunedin Multidisciplinary Health and Development Study-Parenting Study.

was strongest for social outcomes. Women who have experienced CSA might have elevated rates of post-traumatic stress symptoms associated with interpersonal trauma,³⁴ and challenges in forming secure attachments, trust, and emotional safety.⁹ Adjusted associations with perinatal mental health symptoms were also observed, although these associations attenuated during the early childhood of their offspring. Such attenuation might be accounted for by different confounder sets or exposure definitions but also aligns with cross-sectional evidence suggesting that links with depressive symptoms weaken across early parenthood.⁷ Evidence of an effect on income was weaker; financial disparities might partly reflect perpetuation of early life disadvantage.

Major strengths of our study include the use of longitudinal data from three population-based preconception cohort studies in two countries. Cohorts varied in setting, design, strengths, and limitations, increasing the study scope and improving confidence in findings. Outcomes were assessed prospectively across pregnancy and early parenthood. However, CSA was self-reported in young adulthood. This limitation is common in CSA research, given the challenges that young people can face in identifying and disclosing CSA, ethical complexities (including potential mandated reporting), increased risk of non-participation, and the limited coverage of health systems data. Women's recollection of abuse remains an important risk marker,³⁵ but might introduce recall biases. In our study, CSA was reported before parenthood and outcome assessment, reducing potential for differential misclassification. Additionally, CSA measures varied across cohorts; we opted to include all experiences reported as CSA, and future examination of type of abuse and perpetrator might further guide intervention and prevention efforts.

Limited evidence was available for a difference in measured preconception characteristics between the original parent cohort samples and those who participated in the intergenerational studies, beyond a slightly higher rate of grandparental high-school non-completion in the APTG3 baseline sample. However, exclusion of younger parents in VIHCS and APTG3 might have introduced bias, potentially resulting in an underestimation of adverse outcomes. Rates of missing data were generally low, but they were higher antenatally due to the challenges of prospectively identifying pregnancies, although data were nonetheless comparable with other major cohorts of a similar timescale.³⁶ We used multiple imputation to handle missing data in VIHCS and APTG3.

In causal analyses, we adjusted for indicators of socioeconomic adversity, household dysfunction, and other adversities. Although broad, our range was limited to available covariates, and the potential for residual confounding remains. Additionally, temporal sequencing of confounders and the exposure could not be reliably established, as the exposure window spanned from birth to age 16 years. This limitation might have led to an underestimation of effects, due to adjustment of mediators.

The Dunedin-PS sample reflects the age range of parenting in the wider population of New Zealand, and demographic changes over time.³⁷ The sample is broadly representative of the New Zealand South Island on socioeconomic status, and the wider New Zealand population on other health measures and outcomes, although Māori, Pacific, and other minoritised groups are under-represented.¹² VIHCS and APTG3 were designed to represent Victorian and Australian populations at recruitment, but due to attrition and changing population demographics, analysis samples have higher than average household incomes and under-representation of culturally and linguistically diverse populations. Future research should examine CSA outcomes in these diverse populations.

Our findings highlight the importance of trauma-informed interventions that address the diverse mental health and social needs during pregnancy and early parenthood of women who have experienced CSA,⁶ accounting for the potential of birthing and maternity care to retraumatise individuals, as well as factors that undermine women's sense of agency.³ There is an impetus in several countries to integrate trauma-informed care into maternity care based on key safety principles: trustworthiness and transparency; peer support; collaboration and mutuality; empowerment, voice, and choice; and awareness of cultural, historical, and gender issues.³⁸ Several trauma-specific psychosocial perinatal interventions³⁹ have shown promise. However, for these to succeed, structural service changes need to occur, including training, screening, development of referral pathways, and continuity of care.³⁸

A lack of evidence is also apparent for programmes specifically developed for women reporting CSA, or for the efficacy of general trauma-informed interventions in these individuals.³⁹ Involvement of women who have experienced CSA in future research and intervention design, as in one pilot study of a co-designed resource,³ remains crucial. Involvement of women with lived experience is particularly important given that women with a history of CSA might not disclose their experience to health-care providers.³

Prevention of CSA and support for women who have experienced CSA remain international priorities.⁴⁰ Our findings add further support for these efforts, suggesting additional potential benefits for individuals as they transition to parenthood of the next generation. A lack of investment remains for strategies to promote healing and recovery from CSA in the preconception period. Such interventions might include structural changes to support mental health and access to health-protecting social resources in young people before pregnancy and in the transition to parenthood, and a focus on equitable care pathways. These efforts will be an important step in reducing intergenerational risks for women and their families.

Contributors

EAS, CAO, and GCP had the idea for the study. EAS, SRA, SGD, and CAO devised the analysis plan. EAS, HM, and RJH contributed to data collection. SRA and EAS contributed to data curation. SRA conducted the analysis with input from SGD, HM, and CJG, and drafted the tables and supplementary materials with input from EAS. EAS created the figures. EAS drafted the manuscript, with contributions from SRA, CAO, RC, HM, JB, and HG. All authors critically revised and reviewed the manuscript for important intellectual content. SRA and CAO accessed and verified the VIHCS and ATPG3 data; HM and RJH accessed and verified the Dunedin-PS data. All authors (except GCP, now deceased) could apply for full access to the data, and had final responsibility for the decision to submit for publication.

Declaration of interests

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Data sharing

Analysis code is publicly available at: https://osf.io/7ne4q/?view_only=fe22650118cd4587a88ebe3496e67a7c. Ethics approvals for the datasets included in this study do not permit the data to be made publicly available, due to limitations of participant consent and concerns regarding potential re-identifiability. On request, the VIHCS and ATPG3 data subsets can be made available to a named individual for the purpose of replication of research findings. Requests to access these datasets should be directed to <https://lifecourse.melbournechildrens.com/data-access/>. Queries regarding access to the Dunedin-PS dataset should be directed to RJH (bob.hancox@otago.ac.nz).

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