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Child Protection and Practice 3 (2024) 100053

Contents lists available at ScienceDirect

Child Protection and Practice

journal homepage: www.sciencedirect.com/journal/child-protection-and-practice

Exploring the intergenerational continuity of ACEs amongst a sample of Welsh male prisoners: A retrospective cross-sectional study

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ARTICLE INFO

Keywords:
Adverse childhood experiences
Intergenerational continuity
Trauma
Justice
Incarceration

ABSTRACT

Background: The relationship between parent and child adverse childhood experience (ACE) exposure remains underexplored, particularly within justice-involved samples.
Objective: This objective of the study was to examine the intergenerational continuity of ACEs within a UK prison population.
Participants: 294 males aged 18–69 years in a Welsh prison, with father reported data for 671 children they had fathered.
Methods: A face-to-face ACE questionnaire measured exposure to 10 ACE types. For each child they had fathered participants were asked to report their child's gender, age and their exposure before the age of 18 to the same ACE types, except having a household member incarcerated.
Findings: Paternal ACE exposure was found to increase the risk of child ACE exposure, both to multiple ACEs and individual ACE types. Compared to children of fathers with no ACEs, those of fathers with 4+ were almost three times more likely to have been exposed to 2–3 ACEs and six times more likely to be exposed to 4+ ACEs. The risk of a child residing in a household where mental illness was present was 7.4 times higher where their father had 4+ ACEs.
Conclusion: Findings highlight the need for prevention interventions to break the intergenerational continuity of ACEs. Further research is needed to explore what protects against the intergenerational continuity of ACEs. Criminal justice systems and wider services need to ensure that they support those incarcerated alongside their families who are at high risk of ACEs and consequently poorer education, health and criminal justice outcomes.

1. Introduction

Research has documented the intergenerational transmission of offending from parent to child (Ng et al., 2013). A systematic review and meta-analysis found that children with criminal parents experienced more than twice the risk of perpetrating criminal behaviour than those without criminal parents (Besemer et al., 2017). The risk factors predicting offending behaviour and criminal convictions have been shown to be similar across generations and include parental incarceration, harsh discipline, low educational attainment and income, and risk-taking behaviour (Farrington et al., 2015). Research has identified strong links between exposure to adverse childhood experiences (ACEs; childhood maltreatment and exposure to other potential sources of trauma, such as growing up in homes with parental separation, domestic violence, mental ill health and substance misuse) and antisocial behaviour, violence involvement, serious offending and recidivism (Bellis, Hughes, Ford, Edwards, et al., 2018; Craig et al., 2017; Duke et al., 2010; Farrington & Malvaso, 2019; Hughes et al., 2017; Malvaso et al., 2021). Correspondingly, justice-involved populations are more likely to have been exposed to ACEs than general populations (Ford et al., 2020; Skarupski et al., 2016). For example, 84.2% of a UK male prison population reported exposure to at least one ACE, with 45.5% reporting exposure to four or more ACEs (Ford et al., 2019); compared with 44.7% and 9.6% respectively in UK general population samples

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https://doi.org/10.1016/j.chipro.2024.100053
Received 30 May 2024; Received in revised form 22 July 2024; Accepted 5 August 2024
Available online 8 August 2024

(Hughes et al., 2020).

It is important that the experience of trauma in an intergenerational context is understood. Parental exposure to child maltreatment (e.g. physical abuse) has been shown to be associated with childhood social-emotional problems (Zhang et al., 2022), behavioural problems and a lower level of child functioning (Wang et al., 2022). Both individual and cumulative ACE exposure have been found to have intergenerational continuity (Andrzejewski et al., 2022; Kim, 2009; Madigan et al., 2019; Narayan et al., 2017, 2021; Negriff, 2020; Schofield et al., 2018). A meta-analysis identified that the odds of children experiencing child maltreatment were almost three times higher when their parents had experienced child maltreatment, compared to those whose parents had not (Assink et al., 2018). In a US sample, parental ACEs were associated with child exposure to adverse family experiences (Reese et al., 2022). A further US study found that children with parents who had experienced multiple ACEs had over a three-fold higher risk of experiencing multiple ACEs themselves (compared to children whose parents had no ACEs (Schickedanz et al., 2021)). Furthermore, in a UK sample, parental ACE exposure was associated with ACEs of the next generation, with male participants being twice as likely to have multiple ACEs if their father also had a high ACE score. However, these relationships were impacted by other risk factors such as family income and size (Craig et al., 2021). The intergenerational continuity of ACEs is not pre-determined. ACEs are preventable and for those exposed, protective or promotive resilience factors (e.g. trusted adult support, community social support) have been found to buffer against the harmful associated effects (e.g. mental illness; Fritz et al., 2018; Hughes et al., 2018). Furthermore, parental positive childhood experiences have also been shown to be transmitted across generations (Narayan et al., 2021).

Despite known intergenerational links for offending behaviour, the relationship between parent and child ACE exposure remains relatively underexplored, particularly within UK samples and those who are justice-involved (Craig et al., 2023). Parental justice involvement represents a direct ACE for a child while other individual ACE types are criminal acts (e.g. sexual abuse, domestic abuse) or strongly related to criminal activity (e.g. substance use) (Graf et al., 2021), thus children of prisoners are a population vulnerable to experiencing multiple ACEs. This current study seeks to examine the intergenerational continuity of ACEs within a UK prisoner population by exploring relationships between incarcerated parents' ACE exposure and that of their children using both ACE type and cumulative ACE exposure measures. An understanding of the intergenerational continuity of ACEs is important so that intergenerational cycles can be broken and effective strategies for the prevention of ACEs in future generations developed (Assink et al., 2018).

2. Materials and methods

Primary data was collected in a male prisoner population (Ford et al., 2019, 2020) to explore the associations between ACEs and offending. A convenience sample of males was recruited from Her Majesty's Prison (HMP) Parc, the largest prison in Wales at the time of data collection (February–June 2018). To provide an adequate sample size of respondents for analysis across ACE counts, the research aimed to survey a third of the eligible prison population (~1448 during data collection). Study eligibility criteria were: 18–69 years of age; cognitively able to participate; and not currently being managed under the Assessment, Care in Custody & Teamwork (ACCT) procedures (i.e., the care planning process for being at risk of suicide or self-harm (Ministry of Justice, 2021). The latter criterion was included at the request of prison governance as individuals managed under ACCT were considered potentially too vulnerable to participate.

Study advertisements were shown on electronic information points within each prison unit in advance of fieldwork and leaflets advertising the study were distributed during the data collection period. Potential participants were approached by trained researchers during their free time and provided with a verbal description of the study aims and methodology and a copy of the study leaflet. Those interested in participating provided their name and/or prison identification numbers. Potential participants were then provided with a suitable time/date to complete the interview (Monday-Thursday, 8:00am-6:30pm).

At the point of interview, trained researchers provided participants with a study information sheet and verbally outlined the study purpose; its voluntary, anonymous, and confidential nature; that participation or declining to participate would not affect their care; and an independent prison contact for issues or complaints. Before proceeding with the survey, participants were given the opportunity to ask questions and provided written informed consent. Paper questionnaires containing no identifiers were completed, with participants given the option to self-complete more sensitive questions (e.g., ACEs). After completion, participants were provided with a thank you leaflet which included contact details for a designated prison contact and information on accessible help and support. No personal identifying data were collected from prisoners except for the purpose of recruitment and the written record of consent, which were stored separately to study questionnaires. Participants could complete the survey in English or Welsh language.

All questionnaire measures were self-reported. Standardised survey questions from the US Centers for Disease Control and Prevention short ACE tool (Centers for Disease Control and Prevention, n.d.) and World Health Organization's Short Child Maltreatment Questionnaire (Meinck et al., 2016) were used to measure exposure to 10 ACE types before the age of 18 years (physical, verbal or sexual abuse, physical neglect, parental separation, witnessing domestic violence, and living with a household member who was a problem alcohol user, a drug user, mentally ill, or incarcerated). Participants were asked to report their ethnicity (self-identified using UK census categories), the number of children they had fathered, and for each child, their gender, age and exposure before the age of 18 to the same ACE types, except having a household member incarcerated (see Additional file 1: Table A1). Ethical approval was obtained from Bangor University's Health Sciences and Medical Sciences Ethics Committee (2017–16210), the National Health Service (NHS) Research Ethics Committee (Reference 17/WA/0249), and Her Majesty's Prison and Probation Service. Research and development approval was also granted by the Public Health Wales Research and Development Office. Consistent with our ethical approval, informed written consent was obtained from all participants.

The overall participation rate for the study was 71.4%; of 696 individuals contacted, 3.7% (n = 26) left the prison before participation, 27.0% (n = 188) declined, 2.4% (n = 12) of those who opted to participate were ineligible, and 470 completed the questionnaire. Individuals who did not provide all data required to generate their ACE count (n = 2) and those who reported they did not have children (n = 171) were removed from the sample. Data for 14 children were also removed because of missing data or due to child mortality, resulting in a final sample of 294 respondents and their 671 children.

Due to low numbers in individual non-white ethnic groups, ethnicity was re-categorised into white and other than white ethnicity. In line with international literature (Hughes et al., 2017), the number of ACEs that participants reported experiencing was summed (range 0–10) and categorised into an ACE count (0, 1, 2–3, 4+). This process was followed for ACEs reported for each child, using ACE counts 1, 2–3, 4+, with all children allocated one ACE for experiencing substantive parental involvement with the criminal justice system (i.e., current incarceration of their father). For the purpose of analysis, child age (range 0–50 years) was categorised into 0–3, 4–11, 12–17 and 18+ and number of siblings 0, 1 and 2+.

Statistical analyses were completed using SPSS v25. Analyses employed chi-square tests to initially examine bivariate associations between child ACE count and individual ACE exposure with child demographics (age, gender), number of siblings and father ACE count, individual ACE exposure and ethnicity. Multinomial and bivariate

Table 1
Sample demographics and adverse childhood experience (ACE) prevalence.

		Father		Child	
		%	n	%	n
All			294		671
Child age (years)	0–3	–	–	20.3	136
	4–11	–	–	31.9	214
	12–17	–	–	17.4	117
	18+	–	–	30.4	204
Gender	Male	100	294	48.7	327
	Female	–	–	51.3	344
Number of siblings	0	–	–	14.5	97
	1	–	–	32.5	218
	2+	–	–	53.1	356
Father ethnicity	White	–	–	86.4	580
	Other than white	–	–	13.6	91
ACE count	0	15.6	46	–	–
	1	17.0	50	41.7	280
	2–3	21.8	64	36.5	245
	4+	45.6	134	21.8	146
ACE type	Physical abuse	43.5	128	5.2	35
	Verbal abuse	49.7	146	11.3	76
	Sexual abuse	18.2	53	1.8	12
	Parental separation/divorce	58.0	170	19.5	131
	Domestic violence	45.1	132	15.8	96
	Mental illness	26.9	79	29.8	200
	Alcohol abuse	28.2	83	18.8	126
	Drug abuse	34.0	100	34.0	228
	Physical neglect	12.6	37	1.8	12
	Criminal justice involvement	33.7	99	100.0	671

logistic regression were then used to examine the independent contributions of parental ACE count and types on each outcome of interest, controlling for demographics (i.e., adjusted for child age and gender, father ethnicity and number of siblings) and a father unique identifier (father ID) to account for fathers who had multiple children in the sample.

3. Results

Father demographics and ACE exposure are shown in Table 1. The majority (86.4%) of fathers were of white ethnicity and over half (53.1%) reported having fathered three or more children. The majority of fathers (84.4%) reported having experienced at least one ACE, with 45.6% reporting exposure to 4+ ACEs. Individual ACE prevalence varied from 12.6% reporting physical neglect to 58.0% reporting parental separation/divorce. A third (33.7%) of fathers reported household criminal justice involvement during childhood. Just over half (51.3%) of the children in the sample were female, with seven in ten (69.6%) aged under 18 years old.

3.1. Child ACE count

A fifth (21.8%) of children were reported (by fathers) to have been exposed to 4+ ACEs (Table 1). Bivariate relationships between child ACE count and child demographics, father ethnicity and father ACE exposure and are shown in Table 2. Multiple ACE exposure in children was significantly associated with older child age (17.9% of those with 1 ACE were aged 18+, compared with 42.5% of those with 4+ ACEs) and having siblings (47.9% of those with 1 ACE had 2+ siblings compared with 67.8% of those with 4+ ACEs). There were no relationships between child ACE count and child gender or father ethnicity. Child ACE count was also associated with father ACE count; 35.0% of children with 1 ACE had a father who had experienced 4+ ACEs, rising to 58.9% of children with 4+ ACEs (see Table 2).

In multinomial logistic regression (controlling for relationships between variables and father ID), child ACE count remained strongly related to father ACE count (Table 3). Thus, compared with children of fathers with no ACEs, those of fathers with 4+ ACEs were 2.7 times more likely to have 2–3 ACEs and 6.0 times more likely to have 4+ ACEs (v 1 ACE). There was also increased risk for children having 4+ ACEs where their father had experienced 2–3 ACEs. Relationships with child age also remained: compared to children aged 0–3, children aged 18+ were 4.7 times more likely to have 2–3 ACEs and 12.7 times more likely to have 4+ ACEs. Number of siblings showed no independent association with child ACE count (see Table 3).

When examining the relationship between father ACE type and child ACE count, in bivariate analysis father exposure to all ACE types except criminal justice involvement was associated with children having 4+ ACEs (Table 2). In multinomial logistic regression (adjusting for confounders and father ID; Table A2), father exposure to sexual abuse or household mental illness increased the risk of children having multiple (2–3 or 4+) ACEs and father exposure to domestic violence or drug abuse increased the risk of children having 4+ ACEs. Father exposure to household criminal justice involvement reduced the risk for children having multiple (2–3 or 4+) ACEs. Child age remained significantly associated with increased ACE exposure (see Table A2).

3.2. Child individual ACE exposure

The proportion of children reported by fathers to have been exposed to individual ACEs ranged from 1.8% for sexual abuse and physical neglect to 34.0% for household drug abuse (see Table 1; all children were recorded as having been exposed to household criminal justice involvement). In bivariate analysis (Table 4a and b), female gender was associated with child experience of sexual abuse and household alcohol abuse. Child age was associated with child exposure to all ACE types except mental illness and physical neglect, whilst having 2+ siblings was associated with child exposure to verbal abuse, parental separation/divorce, witnessing domestic violence, household mental illness and alcohol abuse. Father ethnicity was only significantly associated with

Table 2
Bivariate relationships between father ACE exposure, demographic factors and child ACE count.

		Child ACE count				
		1	2–3	4+	X^2	p
Child age (years)	0–3	30.0	17.6	6.2		
	4–11	35.7	29.0	29.5		
	12–17	16.4	15.9	21.9		
	18+	17.9	37.6	42.5	58.281	<0.001
Child gender	Male	48.9	50.2	45.9		
	Female	51.1	49.8	54.1	0.689	0.709
Number of siblings	0	18.2	13.5	8.9		
	1	33.9	36.3	23.3		
	2+	47.9	50.2	67.8	18.898	0.001
Father ethnicity	White	84.6	87.3	88.4		
	Other than white	15.4	12.7	11.6	1.401	0.496
Father ACE count	0	22.9	14.7	8.9		
	1	18.2	17.1	6.8		
	2–3	23.9	17.6	25.3		
	4+	35.0	50.6	58.9	38.275	<0.001
Father ACE type	Physical abuse	37.1	46.9	63.7	27.233	<0.001
	Verbal abuse	40.7	53.1	61.0	17.553	<0.001
	Sexual abuse	10.0	25.1	38.4	48.094	<0.001
	Parental separation/divorce	52.0	60.0	63.7	6.410	0.041
	Domestic violence	33.7	47.8	66.9	42.395	<0.001
	Mental illness	15.0	28.6	43.2	40.688	<0.001
	Alcohol abuse	18.9	33.1	46.6	36.462	<0.001
	Drug abuse	26.1	34.3	53.4	31.643	<0.001
	Physical neglect	6.4	13.1	26.7	34.332	<0.001
	Criminal justice involvement	34.6	29.8	36.3	2.175	0.337

ACE = adverse childhood experience.

Table 3
Multinomial regression of child demographics and parental ACE count on child ACE count.

			Child ACE count							
			2-3 ACEs				4+ ACEs			
		Ref cat	**AOR**	**LCI**	**UCI**	**P**	**AOR**	**LCI**	**UCI**	**P**
Child age (years)	0–3	<0.001	Ref				Ref			
	4–11		1.459	0.890	2.393	0.134	3.961	1.784	8.794	<0.001
	12–17		1.953	1.083	3.523	0.026	6.944	2.952	16.337	<0.001
	18+		4.678	2.687	8.146	<0.001	12.663	5.520	29.047	<0.001
Child gender	Male	0.615	1.041	0.726	1.493	0.828	0.843	0.544	1.307	0.446
Number of siblings	0	0.051	Ref				Ref			
	1		1.525	0.880	2.642	0.133	1.419	0.656	3.071	0.374
	2+		1.057	0.615	1.817	0.841	1.860	0.907	3.812	0.090
Father ethnicity	Other than white	0.724	0.854	0.504	1.446	0.557	0.780	0.402	1.513	0.463
Father ACE count	0	<0.001	Ref				Ref			
	1		1.755	0.949	3.245	0.073	1.274	0.493	3.293	0.618
	2–3		1.293	0.720	2.322	0.390	3.234	1.518	6.889	0.002
	4+		2.733	1.632	4.576	<0.001	5.977	2.970	12.028	<0.001
Father unique ID		0.007	0.998	0.997	1.000	0.027	0.998	0.996	0.999	0.003

ACE = adverse childhood experience; AOR = adjusted odds ratio; LCI = lower confidence interval; UCI = upper confidence interval.

child exposure to household mental illness, which was higher in children of fathers of white ethnicity. The relationships between child individual ACE exposure and father ACE count differed across ACE types. However, a significantly higher proportion of children who had been exposed to domestic violence, household mental illness, alcohol abuse and drug abuse had a father who reported a personal experience of four or more ACEs (Table 4a and b). These relationships remained in binary logistic regression, with having a father with 4+ ACEs (v no ACEs) almost doubling risks of child exposure to these ACE types between 1.9 (domestic violence) and 7.4 (mental illness) times (Table 5a and b). Only number of siblings remained significantly associated with child exposure to parental separation/divorce, whilst relationships with child age remained for the majority of child ACE types (Table 5a and b). Due to low numbers of children experiencing sexual abuse and physical neglect, models were not run for these outcomes.

Child exposure to each individual ACE type, except for sexual abuse, was associated with their father having had experienced the same ACE (Table 4a and bb). In binary logistic regression, these relationships remained except for physical abuse, with father experience of these ACE types increasing the risk of child exposure around two to three times (see Tables A3a and b).

Table 4a
Bivariate relationships between father ACE exposure, demographic factors and child ACE types.

		% with and without ACE type by characteristics																	
		Physical abuse				Verbal abuse				Sexual abuse				Parental separation/divorce				Domestic violence			
		No	Yes	X^2	p	No	Yes	X^2	p	No	Yes	X^2	p	No	Yes	X^2	p	No	Yes	X^2	p
Child age (years)	0–3	21.1	5.7			22.2	5.3			20.6	0.0			24.1	4.6			24.3	5.2		
	4–11	32.4	22.9			33.1	22.4			32.5	0.0			34.3	22.1			31.9	38.5		
	12–17	16.8	28.6			16.5	25.0			17.6	8.3			16.5	21.4			16.2	20.8		
	18+	29.7	42.9	9.314	0.025	28.2	47.4	22.885	<0.001	29.3	91.7	22.038	<0.001	25.2	51.9	50.834	<0.001	27.6	35.4	17.614	0.001
Child gender	Male	48.7	48.6			48.1	53.9			49.5	8.3			48.9	48.1			49.5	39.6		
	Female	51.3	51.4	0.000	0.984	51.9	46.1	0.933	0.334	50.5	91.7	7.982	0.005	51.1	51.9	0.027	0.870	50.5	60.4	3.191	0.074
Number of siblings	0	14.9	5.7			15.1	9.2			14.6	8.3			16.9	4.6			17.2	7.3		
	1	32.9	25.7			34.1	19.7			32.6	25.0			35.2	21.4			34.6	30.2		
	2+	52.2	68.6	4.149	0.126	50.8	71.1	11.154	0.004	52.8	66.7	0.954	0.621	48.0	74.0	30.691	<0.001	48.1	62.5	8.864	0.012
Father ethnicity	White	86.0	94.3			85.5	93.4			86.2	100.0			86.3	87.0			85.3	85.4		
	Other than white	14.0	5.7	1.940	0.164	14.5	6.6	3.565	0.059	13.8	0.0	1.917	0.386	13.7	13.0	0.047	0.828	14.7	14.6	0.001	0.981
Father ACE count	0	16.8	17.1			17.1	14.5			17.0	8.3			17.0	16.0			19.0	16.7		
	1	15.7	8.6			16.3	7.9			14.9	41.7			16.7	9.9			17.8	6.3		
	2–3	21.7	25.7			21.8	22.4			21.5	41.7			21.7	22.9			20.9	17.7		
	4+	45.8	48.6	1.409	0.703	44.7	55.3	5.033	0.169	46.6	8.3	11.972	0.007	44.6	51.1	4.234	0.237	42.3	59.4	12.659	0.005
Father ACE type																					
Physical abuse	Yes	45.4	65.7	5.481	0.019	44.7	60.5	6.780	0.009	46.1	66.7	1.998	0.158	45.7	49.6	0.637	0.425	41.5	59.4	10.479	0.001
Verbal abuse	Yes	49.4	54.3	0.321	0.571	47.4	67.1	10.473	0.001	50.1	25.0	2.964	0.085	48.3	55.0	1.853	0.173	47.2	56.3	2.672	0.102
Sexual abuse	Yes	20.2	48.6	15.739	<0.001	20.4	31.6	4.955	0.026	21.3	41.7	2.877	0.147	18.6	34.4	15.421	<0.001	17.3	33.3	13.152	<0.001
Parental separation/ divorce	Yes	57.8	51.4	0.550	0.458	57.7	55.3	0.170	0.680	58.1	25.0	5.268	0.022	55.1	67.2	6.285	0.012	54.9	61.5	1.409	0.235
Domestic violence	Yes	45.2	62.9	4.148	0.042	44.4	60.0	6.524	0.011	46.5	25.0	2.201	0.138	45.3	49.6	0.788	0.375	39.9	64.2	19.227	<0.001
Mental illness	Yes	25.2	42.9	5.391	0.020	24.4	39.5	7.975	0.005	26.4	8.3	1.996	0.201	25.7	27.5	0.166	0.684	23.3	39.6	11.192	0.001
Alcohol abuse	Yes	29.2	45.7	4.276	0.039	28.4	43.4	7.223	0.007	30.2	25.0	0.151	1.000	27.8	39.7	7.115	0.008	25.6	41.7	10.264	0.001
Drug abuse	Yes	34.9	37.1	0.073	0.787	33.4	47.4	5.741	0.017	35.7	0.0	6.586	0.011	33.9	39.7	1.562	0.211	33.3	55.2	16.739	<0.001
Physical neglect	Yes	12.3	31.4	10.591	0.003	11.1	30.3	21.529	<0.001	13.5	0.0	1.868	0.383	11.3	21.4	9.307	0.002	11.0	26.0	15.899	<0.001
Criminal justice involvement	Yes	33.6	25.7	0.941	0.332	32.6	38.2	0.936	0.333	33.8	0.0	6.082	0.011	34.1	29.8	0.880	0.348	32.9	41.7	2.772	0.096

ACE = adverse childhood experience.

Table 4b
Bivariate relationships between father ACE exposure, demographic factors and child ACE types.

		% with and without ACE type by characteristics															
		Mental illness				Alcohol abuse				Drug abuse				Physical neglect			
		No	Yes	X^2	p	No	Yes	X^2	p	No	Yes	X^2	p	No	Yes	X^2	p
Child age (years)	0–3	21.4	17.5			23.5	6.3			24.4	12.3			20.6	0.0		
	4–11	31.6	32.5			33.8	23.8			29.8	36.0			31.9	33.3		
	12–17	18.9	14.0			16.7	20.6			15.8	20.6			17.6	8.3		
	18+	28.0	36.0	5.977	0.113	26.1	49.2	36.959	<0.001	30.0	31.1	14.728	0.002	29.9	58.3	6.200	0.102
Child gender	Male	48.4	49.5			51.0	38.9			46.7	52.6			48.9	41.7		
	Female	51.6	50.5	0.067	0.796	49.0	61.1	6.017	0.014	53.3	47.4	2.101	0.147	51.1	58.3	0.244	0.621
Number of siblings	0	16.6	9.5			15.2	11.1			14.7	14.0			14.6	8.3		
	1	30.6	37.0			35.6	19.0			32.7	32.0			32.8	16.7		
	2+	52.9	53.5	6.637	0.036	49.2	69.8	18.066	<0.001	52.6	53.9	0.118	0.943	52.7	75.0	2.367	0.306
Father ethnicity	White	83.9	92.5			85.7	89.7			85.1	89.0			86.2	100.0		
	Other than white	16.1	7.5	8.931	0.003	14.3	10.3	1.393	0.238	14.9	11.0	1.987	0.159	13.8	0.0	1.917	0.386
Father ACE count	0	21.7	5.5			18.5	9.5			21.2	8.3			17.0	8.3		
	1	17.4	10.5			16.7	9.5			17.8	10.5			15.5	8.3		
	2–3	22.7	20.0			20.6	27.8			23.0	19.7			22.2	8.3		
	4+	38.2	64.0	46.931	<0.001	44.2	53.2	12.590	0.006	37.9	61.4	38.899	<0.001	45.4	75.0	4.199	0.241
Father ACE type																	
Physical abuse	Yes	40.6	60.5	22.455	<0.001	42.9	61.9	14.802	<0.001	38.6	61.8	32.685	<0.001	45.8	83.3	6.664	0.010
Verbal abuse	Yes	41.8	68.0	38.473	<0.001	47.9	57.1	3.505	0.061	42.4	63.6	26.957	<0.001	49.0	83.3	5.553	0.018
Sexual abuse	Yes	14.2	39.4	52.016	<0.001	19.7	30.2	6.583	0.010	14.5	35.7	39.717	<0.001	20.7	75.0	20.468	<0.001
Parental separation/divorce	Yes	52.8	68.5	14.209	<0.001	57.7	56.3	0.079	0.779	52.9	66.2	10.864	0.001	57.3	66.7	0.423	0.515
Domestic violence	Yes	38.1	64.8	39.883	<0.001	41.6	65.6	23.439	<0.001	37.2	63.4	41.485	<0.001	45.8	66.7	2.069	0.150
Mental illness	Yes	17.2	47.0	64.679	<0.001	23.1	38.9	13.201	<0.001	16.7	44.3	59.452	<0.001	25.3	66.7	10.440	0.003
Alcohol abuse	Yes	24.0	44.5	28.062	<0.001	25.9	48.4	24.713	<0.001	23.5	43.0	27.220	<0.001	29.4	66.7	7.763	0.009
Drug abuse	Yes	27.8	52.0	36.089	<0.001	33.2	42.9	4.184	0.041	26.4	51.8	42.486	<0.001	34.4	66.7	5.377	0.030
Physical neglect	Yes	11.0	18.5	6.790	0.009	11.4	21.4	8.989	0.003	8.6	22.4	24.883	<0.001	12.4	58.3	21.573	<0.001
Criminal justice involvement	Yes	31.4	37.5	2.337	0.126	33.9	30.2	0.661	0.416	29.1	41.2	9.946	0.002	32.8	58.3	3.469	0.117

ACE = adverse childhood experience.

4. Discussion

Individuals involved in the criminal justice system report a higher prevalence of ACEs than identified in studies with general population samples. Here, the majority of fathers reported that they had experienced at least one ACE with over four in ten reporting exposure to four or more ACE types. Few studies have examined the intergenerational continuity of ACEs, particularly in justice-involved populations. This study found evidence for the intergenerational continuity of ACEs within a UK sample of incarcerated fathers.

Paternal experience of multiple ACEs was found to increase the risk of child exposure to multiple ACEs. Thus, compared to children of fathers with no ACEs, those of fathers with four or more were almost three times more likely to have been exposed to 2–3 ACEs and six times more likely to have been exposed to four or more ACEs. These findings are in line with previous research showing that parental ACEs can increase the likelihood of child ACEs (Craig et al., 2021). Parenting behaviours may have roots in an individual's exposure to ACEs. Mechanisms for this may include the impact of ACEs on childhood brain development and reactivity which may in turn impair emotional health and the quality of parenting; and the association between multiple ACE exposure and risks of harmful health and social behaviours such as alcohol misuse, drug use and criminal behaviours that represent ACEs to the offspring of those affected (Negriff, 2020).

Consistent with these effects, paternal experience of multiple ACEs was found to increase the risk of child exposure to various individual ACE types, including alcohol abuse and drug abuse, exposure to domestic violence and household member mental illness. Specifically, the risk of a child residing in a household where mental illness was present was over 7 times (AOR 7.4) higher where their father had been exposed to four or more ACEs, compared to children whose fathers had experienced no ACEs. Previous research has shown that parents' ACE exposure is associated with their children developing mental health problems and externalizing difficulties (Racine et al., 2023). While our study did not identify whether it was the father himself or another household member who had experienced mental illness, a large body of evidence links exposure to multiple ACEs to increased risks of developing mental illness across the life course. Thus parents that have suffered ACEs can be vulnerable to mental illness which represents a direct ACE for their children. Poor mental health may also impact functioning and empathy, therefore potentially increasing the risk of the perpetration of other ACEs such as physical and emotional abuse (Narayan et al., 2021; Reese et al., 2022).

Study findings indicated that children of fathers with four or more ACEs were also at over four times increased risk of exposure to household member drug abuse, at over three times increased risk of exposure to parental alcohol abuse and at almost double the risk of exposure to domestic violence. Exposure to multiple ACEs has been linked to the development of behaviours that lead children to be exposed to ACEs. For example, strong relationships are found between childhood adversity and alcohol- and substance use-related disorders in later life as well as violence involvement (Afifi et al., 2014; Anda et al., 2005; Dube et al., 2003; Kisely et al., 2021). Such behaviours, although potential coping mechanisms for having experienced abuse, represent ACEs for future generations. Mental health, domestic violence and substance abuse also often co-occur.

Evidence links ACEs to a variety of other forms of violence, including child maltreatment. A systematic review identified that children were almost three times more likely to experience child maltreatment where their parents had also experienced child maltreatment (Assink et al., 2018). Here, despite a high prevalence of physical abuse experienced by fathers in this sample, we found no association between fathers' ACE count and risks of child exposure to physical, emotional or sexual abuse when other confounders were adjusted for. However, the father-reported prevalence of child exposure to these types of child maltreatment was low compared to the prevalence of these ACE types in

Table 5a
Logistic regression of child demographics and parental ACE type on child ACE exposure.

		Child ACE type															
		Physical abuse				Verbal abuse				Parental separation/divorce				Domestic violence			
		AOR	LCI	UCI	P	AOR	LCI	UCI	P	AOR	LCI	UCI	P	AOR	LCI	UCI	P
Child age (years)	0–3	Ref			0.080	Ref			0.002	Ref			<0.001	Ref			0.003
	4–11	2.316	0.476	11.265	0.298	2.690	0.872	8.292	0.085	2.930	1.171	7.334	0.022	5.244	1.963	14.008	<0.001
	12–17	5.662	1.189	26.959	0.029	5.912	1.910	18.298	0.002	5.688	2.231	14.506	<0.001	6.426	2.244	18.403	<0.001
	18+	4.417	0.956	20.415	0.057	5.848	1.967	17.383	0.001	8.131	3.335	19.823	<0.001	6.416	2.319	17.752	<0.001
Child gender	Male	0.955	0.474	1.923	0.897	1.243	0.756	2.046	0.392	0.989	0.659	1.484	0.956	0.642	0.401	1.026	0.064
Number of siblings	0	Ref			0.559	Ref			0.169	Ref			0.002	Ref			0.088
	1	1.954	0.405	9.426	0.404	0.867	0.333	2.260	0.770	2.186	0.854	5.593	0.103	2.336	0.941	5.797	0.067
	2+	2.256	0.507	10.040	0.285	1.542	0.653	3.640	0.323	3.955	1.634	9.570	0.002	2.634	1.113	6.235	0.028
Father ethnicity	Other than white	0.494	0.112	2.173	0.351	0.464	0.176	1.224	0.121	1.222	0.653	2.287	0.531	0.956	0.491	1.858	0.893
Father ACE count	0	Ref			0.760	Ref			0.153	Ref			0.221	Ref			0.004
	1	0.515	0.120	2.211	0.372	0.677	0.232	1.971	0.474	0.883	0.399	1.953	0.759	0.417	0.151	1.152	0.092
	2–3	1.023	0.339	3.087	0.968	1.248	0.543	2.869	0.602	1.400	0.726	2.701	0.315	1.130	0.527	2.424	0.753
	4+	1.016	0.377	2.739	0.975	1.706	0.823	3.539	0.151	1.582	0.885	2.828	0.122	1.921	1.022	3.612	0.043
Father unique ID		0.996	0.994	0.999	0.006	0.998	0.996	1.000	0.038	1.000	0.999	1.002	0.772	0.996	0.994	0.998	<0.001

ACE = adverse childhood experience; AOR = adjusted odds ratio; LCI = lower confidence interval; UCI = upper confidence interval.

Table 5b
Logistic regression of child demographics and parental ACE type on child ACE exposure.

		Child ACE type											
		Mental illness				Alcohol abuse				Drug abuse			
		AOR	LCI	UCI	P	AOR	LCI	UCI	P	AOR	LCI	UCI	P
Child age (years)	0–3	Ref			0.075	Ref			<0.001	Ref			0.001
	4–11	1.315	0.785	2.202	0.298	2.642	1.153	6.055	0.022	2.617	1.552	4.412	<0.001
	12–17	0.912	0.494	1.682	0.768	4.433	1.879	10.460	<0.001	2.961	1.644	5.331	<0.001
	18+	1.733	1.015	2.960	0.044	6.330	2.823	14.192	<0.001	2.346	1.353	4.066	0.002
Child gender	Male	0.988	0.694	1.408	0.948	0.580	0.382	0.881	0.011	1.220	0.870	1.711	0.250
Number of siblings	0	Ref			0.027	Ref			0.031	Ref			0.948
	1	2.263	1.235	4.147	0.008	0.636	0.303	1.333	0.231	0.985	0.574	1.691	0.958
	2+	1.680	0.927	3.043	0.087	1.283	0.664	2.481	0.458	0.933	0.554	1.569	0.793
Father ethnicity	Other than white	0.362	0.197	0.666	0.001	0.776	0.397	1.515	0.457	0.588	0.349	0.992	0.047
Father ACE count	0	Ref			<0.001	Ref			0.002	Ref			<0.001
	1	2.507	1.123	5.597	0.025	1.472	0.605	3.580	0.394	1.692	0.848	3.373	0.136
	2–3	3.483	1.676	7.239	<0.001	3.200	1.527	6.706	0.002	2.287	1.233	4.241	0.009
	4+	7.425	3.776	14.600	<0.001	3.158	1.589	6.276	0.001	4.479	2.572	7.801	<0.001
Father unique ID		0.999	0.997	1.000	0.038	1.000	0.998	1.001	0.859	0.998	0.997	1.000	0.011

ACE = adverse childhood experience; AOR = adjusted odds ratio; LCI = lower confidence interval; UCI = upper confidence interval.

studies conducted in general population samples. For example, here 5.2% of children were reported by fathers to have experienced physical abuse, versus 15.9% of adults in England and Wales reporting having experienced this ACE type (Bellis et al., 2023); 11.3% and 20.7% for verbal abuse and 1.8% and 7.4% for sexual abuse, respectively. There are several potential reasons for this, including a lack of willingness of fathers to report violent and illegal behaviour, a lack of awareness of these often hidden ACEs in incarcerated parents, or potentially that paternal absence from the family home (due to imprisonment) may protect children from abuse.

A strong association between intergenerational exposure of individual ACE types was also identified. Children were approximately two times more likely to be exposed to emotional abuse, alcohol or drug abuse, parental separation/divorce, and domestic violence and over three times more likely to live in a household where mental illness is present if their father had experienced these ACE types. This latter finding is in line with wider evidence indicating that children of parents with severe mental illness are at increased risk of developing mental disorders by early adulthood (Rasic et al., 2014) which may be partly due to genetic transmission (Jami et al., 2021).

Some individual ACE types experienced by fathers were also associated with children being exposed to multiple ACEs. In line with other research (Madigan et al., 2019), the risk of a child having four or more ACEs was more than doubled when their fathers had experienced sexual abuse. Child exposure to mental illness and drug abuse was also associated with father sexual abuse. However, due to small numbers of sexual abuse reported for the children in this sample, we were unable to explore the intergenerational transmission of this single ACE type from father to child.

Importantly, although ACE exposure may increase the risk of continuity of ACEs, it is not deterministic and other factors may contribute to their intergenerational transmission (Assink et al., 2018; Narayan et al., 2021; Reese et al., 2022). Research has shown that resilience resources can lessen the risk of experiencing the negative outcomes associated with ACEs (Bellis, Hughes, Ford, Hardcastle, et al., 2018; Woods-Jaeger et al., 2018). Safe, stable and nurturing relationships have been shown to offer a protective effect on maltreatment continuity and therefore, may be a key protective strategy for preventing continued maltreatment

(Schofield et al., 2013). Further research is needed to explore what protects against the intergenerational continuity of ACEs. Research in the US has indicated that community social cohesion and the density of alcohol retailers may help to break generational cycles of maltreatment (Schofield et al., 2018). However, further research is required to explore the protective factors that may break intergenerational continuity of ACEs, particularly in those who are already justice-affected and who are likely to have a high ACE exposure.

Policy in the UK has highlighted the need for the prevention of ACEs and work to mitigate their lifelong negative effects. In the UK, Her Majesty's Prison and Probation Service (HMPPS) has aimed to reform prison services to improve support to vulnerable individuals. In Wales, as part of the Welsh Government 'A Framework to Support Positive Change for those at Risk of Offending in Wales (2018–23)' (Welsh Government and Her Majesty's Prison and Probation Service, 2017) work is ongoing to ensure criminal justice services are trauma informed and ACE aware (Beer et al., 2020). This work is important to prevent ACEs and limit their negative effects. The findings here, indicate a need for positive parenting courses for criminal justice involved populations. The long-term impacts of parenting programmes for male offenders are rarely assessed (Buston et al., 2012). However, studies suggest that positive attitudes of participants towards courses increased participant knowledge and positive attitudinal changes for parenting following participation (Buston et al., 2012). An evaluation of a trauma-informed parenting education programme for imprisoned mothers in Australia, found participants reported increased child and family connection following participation (Lovell et al., 2023). Support should not just be directed at those who are already incarcerated or in contact with probation services. Wider approaches that consider the whole family of those who are justice-involved are required and positive examples of this are emerging in the UK (Rees et al., 2017; Ugwudike, 2017). Whilst an understanding that children of prisoners are more likely to have high ACEs is important at the community level, services should work to build resilience in those who are already affected. Evidence for this model of provision are now emerging (Harris et al., 2023).

A number of limitations should be considered in the interpretation of these findings. Only correlation and not causal relationship for the intergenerational continuity of ACEs have been identified. A convenience sample was used and therefore the sample cannot be considered to be representative of the prisoners in the prison studied, nor the wider prison population in England and Wales. Furthermore, no information were recorded on the individuals who declined participation in the study, therefore we are unable to identify any bias through self-selection to participate. All questions used were self-reported and retrospective and are limited to reporting bias and accurate recall. Child ACEs were retrospectively parent reported which may explain some concordance for the continuity of ACEs as per other studies (Narayan et al., 2017). Our child ACE prevalence relies on fathers' knowledge of their children's exposure to ACEs. Some fathers may have been separated from or had limited contact with their children and consequently may not have knowledge of their child's exposure to such experiences. Thus the child ACE prevalence identified here may underrepresent exposure to ACEs. The under-reporting of child exposure to adversity could contribute to more conservative findings, although the rates for child ACE exposure identified here were higher than those recorded for the general population in England and Wales, except for sexual abuse. To account for fathers having multiple children we included a unique father identifier in the analysis. For reported children over the age of 18, we were unable to identify if their father had been in prison prior to them turning 18. As all participants were incarcerated at the time of survey collection, we used a measure of significant involvement with the criminal justice system to measure exposure to this ACE. In this study we have only explored intergenerational continuity within the context of paternal ACE exposure. Further research should explore links between intergenerational maternal ACEs as other research has shown that mothers' ACE counts were more strongly associated with children's ACE counts than that of their fathers (Schickedanz et al., 2021). The relationships may be explainable due to difference in parenting roles, or the possible link between perinatal mental health and child maltreatment (Ayers et al., 2019). Furthermore, research has identified that the intergenerational transmission of criminal behaviour is strongest for mothers compared to fathers (Besemer et al., 2017; Greene et al., n.d.). Finally, only biological children were enquired about and therefore other children parented by the participants will not have been included.

Future research should explore the intergenerational continuity of ACEs in families, including maternal ACE exposure and in non-justice-involved samples. Research should also consider the stability of parental relationships and the levels of contact between parents and children, particularly in justice-involved samples where parents may be absent due to incarceration. It is important that research also identifies what is effective in breaking intergenerational cycles of childhood adversity, including the role of resilience. Long-term evaluations of family-based interventions in justice populations may also add evidence on how we can protect future generations and support those already affected by ACEs.

5. Conclusions

Given the higher ACE prevalence in criminally justice-involved populations and the evidence here for intergenerational continuity, ACEs should be a key consideration for prisons. Research has shown that few people with ACEs have ever told a professional (Hardcastle & Bellis, 2019). Tackling ACEs could be a key part of preventing future offending for children of fathers with prison experience, and breaking offending recidivism for fathers. Findings here indicate a high exposure to ACEs in relatively large numbers of children. In the UK the Health and Justice Health Needs Assessment (HNA) guidance recognises the high level of childhood abuse that offenders, particularly women, have experienced (Public Health England, 2014). However, the HNA makes no direct reference to the experience of ACEs. Evidence here, provides support for the integration of ACEs within the criminal justice system as well as wider services that support not just the prisoner within prison and on release, but also the families of those incarcerated who are at high risk of ACEs and consequently poorer education, health and criminal justice outcomes.

Competing interests

None.

Funding

Data collection was supported by the Early Action Together (EAT) programme by the Home Office Police Innovation Fund, the South Wales Police and Crime Commissioner and Public Health Wales NHS Trust (Reference 2016–039). KF and MAB designed the study. The funders had no role in study design, analysis, interpretation of data, or writing of the manuscript.

Data availability

Data will be made available on request.

CRediT authorship contribution statement

Kat Ford: Writing – original draft, Resources, Methodology, Investigation, Formal analysis, Conceptualization. **Mark A. Bellis:** Writing – review & editing, Supervision, Conceptualization. **Karen Hughes:** Writing – review & editing, Supervision. **Natasha Judd:** Writing – review & editing, Formal analysis. **Emma R. Barton:** Writing – review & editing, Resources, Investigation.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Professor M A Bellis reports financial support was provided by Home Office Police Innovation Fund. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We would like to thank all the individuals who kindly participated in the survey. We are indebted to the staff of HMP Parc and the Parc Intervention and Research Panel for assisting the research team with their data collection. We are grateful to Annemarie Newbury, and Zoe Bezeczky for assisting with data collection. We would also like to thank other colleagues at Public Health Wales NHS Trust, United Kingdom who supported the development of the study.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chipro.2024.100053.

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