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# BMJ Open Examining relationships between adverse childhood experiences and coping during the cost-of-living crisis using a national cross-sectional survey in Wales, UK

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## ABSTRACT

**Objectives** Adverse childhood experiences (ACEs) can affect individuals' resilience to stressors and their vulnerability to mental, physical and social harms. This study explored associations between ACEs, financial coping during the cost-of-living crisis and perceived impacts on health and well-being.

**Design** National cross-sectional face-to-face survey. Recruitment used a random quota sample of households stratified by health region and deprivation quintile.

**Setting** Households in Wales, UK.

**Participants** 1880 Welsh residents aged ≥18 years.

**Measures** Outcome variables were perceived inability to cope financially during the cost-of-living crisis; rising costs of living causing substantial distress and anxiety; and self-reported negative impact of rising costs of living on mental health, physical health, family relationships, local levels of antisocial behaviour and violence, and community support. Nine ACEs were measured retrospectively. Socioeconomic and demographic variables included low household income, economic inactivity, residential deprivation and activity limitation.

**Results** The prevalence of all outcomes increased strongly with ACE count. Perceived inability to cope financially during the cost-of-living crisis increased from 14.0% with 0 ACEs to 51.5% with 4+ ACEs. Relationships with ACEs remained after controlling for socioeconomic and demographic factors. Those with 4+ ACEs (vs 0 ACEs) were over three times more likely to perceive they would be unable to cope financially and, correspondingly, almost three times more likely to report substantial distress and anxiety and over three times more likely to report negative impacts on mental health, physical health and family relationships.

**Conclusions** Socioeconomically deprived populations are recognised to be disproportionately impacted by rising costs of living. Our study identifies a history of ACEs as an additional vulnerability that can affect all socioeconomic groups. Definitions of vulnerability during crises and communications with services on who is most likely to be impacted should consider childhood adversity and history of trauma.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The study used a large national sample surveyed face-to-face during the cost-of-living crisis.
- ⇒ Prevalence of adverse childhood experiences (ACEs) reported by participants was consistent with that reported in previous national household samples.
- ⇒ Cost-of-living outcomes were subjective and related to perceived and self-reported measures rather than independently measured outcomes.
- ⇒ Analysis of associations with ACEs controlled for various markers of socioeconomic deprivation, including residential deprivation, low household income and economic activity.

## INTRODUCTION

Adverse childhood experiences (ACEs) such as exposure to child maltreatment, domestic violence and caregiver substance misuse can have detrimental effects on individuals' health and social well-being throughout life. Individuals who suffer ACEs while growing up are at increased risk of adopting health-harming behaviours such as smoking and substance use; experiencing poor mental well-being and mental illness; and developing physical illness and non-communicable diseases such as cancer and cardiovascular disease.<sup>1-3</sup> ACEs are also associated with poorer educational attainment and employment outcomes.<sup>4 5</sup> Thus, suffering ACEs can impact individuals' health and socioeconomic opportunities throughout life, with higher levels of ACEs seen in adults who are residents in deprived communities, economically inactive (eg, unemployed or not working due to ill health) and living on a low income.<sup>6-8</sup> ACEs have also been related to reduced financial well-being in adulthood, including food and housing insecurity, with such effects found to be more

pronounced in low income groups, yet apparent across income levels.<sup>9 10</sup> Further, ACEs have been linked to having lower resilience resources,<sup>11 12</sup> which can affect individuals' ability to cope with stressful situations. Combined, these effects may impact people's vulnerability to the effects of economic crises.

In the wake of the COVID-19 pandemic, countries around the world are experiencing a cost-of-living crisis that is threatening public health and increasing inequality.<sup>13</sup> Events including Russia's invasion of Ukraine and the escalating impacts of climate change have affected supply chains, leading to rapid increases in the price of food, energy and other essential goods,<sup>14</sup> with soaring inflation pushing millions of people around the world into poverty.<sup>15 16</sup> Along with financial impacts, rising costs of living can have wide-ranging health impacts that include reduced mental well-being and harms to physical health when individuals are forced to cut back on essentials such as food, home heating and social activity.<sup>13</sup> Further, the impacts of rising costs of living disproportionately affect socioeconomically deprived populations who spend a greater share of their income on essential items,<sup>17</sup> and consequently widen existing inequalities. In the UK, all households became poorer in 2022 and estimates suggested that one in four households would face food and energy bills exceeding their disposable income in 2023–2024.<sup>18</sup> A range of measures have been implemented by UK and regional governments to support vulnerable households through the cost-of-living crisis,<sup>19</sup> yet a substantial proportion of the population continues to struggle to afford essential goods and concern over costs of living remains high.

Although considerable attention has been paid to poverty-related factors potentially exacerbating the negative impacts of the cost-of-living crisis,<sup>13 20</sup> fewer studies have examined how other vulnerabilities may have affected individuals' well-being. Given the wide range of literature identifying individuals with a history of ACEs as being at greater risk from physical, mental and social harms, it is important to understand whether such vulnerabilities are also related to individuals' ability to cope with stressors resulting from financial shocks such as the cost-of-living crisis. We undertook a national survey of adults in Wales, UK, to measure the impacts of the cost-of-living crisis on population well-being and explore factors that affected individuals' ability to cope. Here, we explore whether having a history of ACEs influences coping and self-reported impacts on health and well-being independent of other demographic risk factors.

## METHODS

### Data collection

A national household survey of residents of Wales aged 18 years and over was undertaken between November 2022 and March 2023. A professional market research company was commissioned to undertake sampling and data collection. A target sample of 2000 participants was set to ensure

sufficient individuals within each ACE category based on previous surveys,<sup>21</sup> for an expected minimum of 200 respondents in the highest ACEs category (4+ ACEs). A stratified quota sampling methodology was used to obtain a sample representative of the national population, with lower super output area (LSOA; small geographical areas with a mean population of approximately 1500) as the sampling unit, stratified by Health Board and deprivation quintile. Within each of the seven Welsh Health Boards, LSOAs were ranked according to their score in the Welsh Index of Multiple Deprivation (WIMD)<sup>22</sup> and categorised into quintiles. A random sample of LSOAs was then selected equally from each deprivation quintile in each Health Board to provide a total sample proportionate to national population share. A total of 200 LSOAs were sampled with a target of 10 interviews per selected LSOA. Residential addresses within each sampled LSOA were extracted from the postcode address file and uploaded to the electronic tablets used by survey interviewers. Quota samples were set for each LSOA by age, sex and economic activity. Only one individual per household was eligible to participate in the survey, with inclusion criteria being aged  $\geq 18$  years, resident in a sampled LSOA and cognitively able to participate in the survey.

Interviewer training was provided by the market research company and study authors to ensure interviewers understood the purpose of the survey, were familiarised with its content and that interviews were conducted sensitively and objectively. Trained interviewers visited households in study areas to invite residents to participate in the study. On contact, household members were provided with a participant information sheet and letter of authority from Public Health Wales, which detailed the purpose of the survey; its contents; its voluntary, anonymous and confidential nature; and how findings would be used. Informed consent was collected and recorded as part of the survey script. Participants could choose to complete the survey in Welsh or English language and all study materials were provided in both languages. Interviews were conducted face to face by interviewers at the participants' doors using computer-assisted personal interviewing, with sensitive questions (including ACE questions) being self-completed. The questionnaire was initially piloted for participant understanding and flow. Questionnaires took an average of 22 min to complete. After completing the questionnaire, participants were provided with a thank you leaflet containing information on support services linked to the survey topics. Just under half (49%) of households contacted and invited to participate in the survey agreed to take part with a total of 2007 questionnaires completed.

### Study questionnaire

The questionnaire included questions on participants' concerns about rising costs of living, perceived impacts on their health and well-being, exposure to ACEs before the age of 18 years and demographics, with full questions

used to measure cost-of-living-related outcomes and ACEs shown in online supplemental appendix table A1.

Exposure to nine ACE types before the age of 18 years was measured using an adapted version of the Centers for Disease Control and Prevention short ACE tool<sup>23</sup>: physical, verbal and sexual abuse; parental separation; exposure to domestic violence; and living with a household member with mental illness, alcohol misuse, drug misuse or who had been incarcerated. The short ACE tool uses 11 questions to measure these nine ACE types, with three questions used to identify exposure to sexual abuse (having been touched sexually, made to touch someone else sexually or forced to have sex by someone at least five years older). Here, to reduce participant burden, we used a single question to measure sexual abuse, incorporating sexual touching and any other sexually abusive behaviour (see online supplemental appendix table A1). Consistent with other ACE studies,<sup>1</sup> ACE questions were summed to calculate an ACE count (0 ACEs, 1 ACE, 2–3 ACEs, 4+ ACEs).

In the absence of validated questions measuring the impact of the extant cost-of-living crisis, outcome measurements were developed in consultation with public health professionals, building on broader survey work in Wales.<sup>24</sup> Perceived inability to cope was measured by the question ‘How confident are you in your ability to cope financially through the cost-of-living crisis?’, with response options of ‘I believe I will be able to cope financially’ and ‘I don’t think I will be able to cope financially’. Selection of the latter option indicated perceived inability to cope. Substantial distress or anxiety was measured through the question ‘For some people, rising costs of living will be causing substantial distress or anxiety. Would you say that this is true for you?’ with response options of ‘yes’ and ‘no’. Further questions asked ‘To date, what impact, if any, has the rising cost of living had on the following: your mental health; your physical health; your relationship with your family; local levels of violence and antisocial behaviour (ASB); and how people support each other in your community’, with response options of ‘negative impact (ie, worsening)’, ‘no impact and ‘positive impact (ie, improving)’. We dichotomised these variables for analyses to identify those self-reporting a negative impact (yes vs no or positive impact).

The survey collected respondents’ sex, age band, ethnicity and postcode of residence. Postcode was converted into LSOA and then categorised into a national deprivation quintile using the WIMD (1=most deprived to 5=least deprived). Ethnicity was self-defined using UK census categories and due to low levels in other than white ethnicities, was recategorised into white (including white minorities) and ethnic minorities (excluding white minorities). Age was categorised into four age groups (18–29, 30–49, 50–69 and 70+) for analyses. Participants were asked what their total annual household income was (including all benefits, before tax and deductions) using categories of £10 000 (from ‘under £10 000 (£0–£192 per week)’ to ‘£100 000 or more’). Those indicating the

lowest two categories (<£20 000) were categorised as ‘yes’ to disclosing low household income with all other participants coded as ‘no’ (see the limitations). Participants were asked to provide their employment status and those responding ‘unemployed’, ‘long-term sick or disabled’ or ‘carer or not working for domestic reasons’ were categorised as ‘yes’ to economic inactivity. Finally, activity limitation was measured using the question: ‘Are your day-to-day activities limited because of a health problem or disability which has lasted or is expected to last for at least 12 months?’ with response options of ‘no’, ‘yes, limited a little’ and ‘yes, limited a lot’.

For the purpose of analyses, we excluded 126 participants who could not be assigned to an ACE count due to missing data and an additional participant who did not provide their age, leaving a final sample of 1880.

### Statistical analysis

Statistical analyses used SPSS V.24. Bivariate relationships between outcome measures and participant demographics and ACE counts were measured using  $\chi^2$  tests. Independent associations between ACEs and outcomes were measured using binary logistic regression (enter method), controlling for other participant demographics.

### Patient and public involvement

The study did not involve patients other than as participants. Study findings are being made publicly available to participants and the public through study reports and open-access journal articles.

## RESULTS

Almost half of participants reported at least 1 ACE (43.4%) and 1 in 10 (10.9%) reported 4 or more ACEs (table 1). Having any ACE and multiple ACEs was more commonly reported by females, younger participants, those resident in more deprived communities, those with low household income, those categorised as economically inactive and those with activity limitation (table 1).

Over one-fifth (22.6%) of participants did not think they would be able to cope financially during the cost-of-living crisis. The proportion perceiving they would be unable to cope increased sharply with ACE count, from 14.0% of those with 0 ACEs to 51.5% of those with 4+ACEs (table 2). This association remained after controlling for socioeconomic and demographic variables, with elevated odds seen at all ACE levels and those with 4+ ACEs being three and half times (adjusted OR (AOR) 3.46) more likely to perceive they would not be able to cope than those with no ACEs (table 2). Perceived inability to cope was also independently associated with younger age (ages 18–49 years, vs 70+ years), living in the most deprived residential quintile (vs the least deprived), economic inactivity, activity limitation and low household income; with this latter characteristic showing the greatest increase in odds of perceived inability to cope (AOR 4.36).

**Table 1** Participant demographics and proportions within ACE count categories

	n	0 ACEs	1 ACE	2–3 ACEs	4+ ACEs	X <sup>2</sup>	P value
		%	%	%	%		
All	1880	56.6	17.9	14.6	10.9		
Sex							
Male	856	58.3	19.5	12.6	9.6		
Female	1024	55.3	16.6	16.2	11.9	9.425	0.024
Age group							
18–29	271	42.1	21.4	19.2	17.3		
30–49	614	52.3	18.2	15.6	13.8		
50–69	564	56.9	19.0	13.8	10.3		
70+	431	71.7	13.9	11.1	3.2	82.392	<0.001
Deprivation quintile							
(Most) 1	362	54.1	14.4	13.8	17.7		
2	367	58.3	17.4	13.9	10.4		
3	385	54.0	21.0	15.1	9.9		
4	379	53.6	19.0	17.9	9.5		
(Least) 5	387	63.0	17.6	12.1	7.2	35.567	<0.001
Ethnicity							
White	1797	56.6	17.9	14.6	10.9		
Ethnic minorities*	83	57.8	19.3	13.3	9.6	0.332	0.954
Low household income							
No	1429	59.8	17.8	13.4	9.0		
Yes	451	46.6	18.2	18.4	16.9	36.332	<0.001
Economic inactivity							
No	1624	59.8	17.9	13.8	8.5		
Yes	256	36.7	18.0	19.5	25.8	86.655	<0.001
Activity limitation							
No	1269	60.2	18.6	13.0	8.2		
A little	331	50.8	16.6	18.1	14.5		
A lot	280	47.5	16.4	17.5	18.6	44.340	<0.001

\*Excluding white minorities.  
ACE, adverse childhood experience.

Over a quarter (26.9%) of participants said that rising costs of living were causing them substantial distress and anxiety. This rose from 17.9% in those with no ACEs to 54.4% in those with 4+ ACEs. Cumulative effects remained in multivariate analyses, with odds of substantial distress and anxiety significantly increased at all ACE levels and reaching AOR 2.92 in those with 4+ACEs (vs no ACEs; [table 2](#)). Reporting substantial distress and anxiety was also independently associated with being female, younger, living in the most deprived residential quintile (vs least deprived), other than white ethnicity, low household income, economic inactivity and activity limitation; with the greatest increase in odds seen in those whose activity was limited a lot (vs no, AOR 3.20).

Across all participants, 44.5% reported that rising costs of living had had a negative impact on their mental

health, 19.0% on their physical health, 16.7% on their relationship with their family, 15.6% on local levels of violence and ASB, and 7.9% on how people support each other in their community ([table 3](#)). The prevalence of each self-reported negative impact increased with ACE count. For example, reporting negative impacts on mental health increased from 34.4% in those with 0 ACEs to 74.5% in those with 4+ ACEs while reporting negative impacts on physical health increased from 11.8% to 43.1%, respectively (see [table 3](#)). These relationships remained in logistic regression analysis, with odds of all self-reported negative impacts increasing significantly at all ACE levels (vs 0 ACEs; [table 4](#)). Thus, compared with individuals with 0 ACEs, those with 4+ ACEs were more than twice as likely to report negative impacts on community support (AOR 2.69); around three times more likely

**Table 2** Bivariate\* and multivariate† relationships between coping during the cost-of-living crisis, ACE count and participant demographics

		Perceived inability to cope financially			Rising cost of living causing substantial distress and anxiety		
		%	AOR (95% CIs)	P value‡	%	AOR (95% CIs)	P value‡
All		22.6			26.9		
ACE count	0 ACEs	14.0	Ref	<0.001	17.9	Ref	<0.001
	1 ACE	23.7	1.70 (1.21 to 2.37)	0.002	27.3	1.53 (1.12 to 2.09)	0.007
	2–3 ACEs	32.8	2.24 (1.58 to 3.15)	<0.001	40.5	2.38 (1.73 to 3.26)	<0.001
	4+ ACEs	51.5	3.46 (2.37 to 5.06)	<0.001	54.4	2.92 (2.04 to 4.19)	<0.001
	X <sup>2</sup>	159.261			148.033		
	P value	<0.001			<0.001		
Low household income	No	15.0	Ref		21.4	Ref	
	Yes	46.6	4.36 (3.28 to 5.79)	<0.001	44.1	2.09 (1.60 to 2.73)	<0.001
	X <sup>2</sup>	195.828			89.997		
	P value	<0.001			<0.001		
Economic inactivity	No	17.1	Ref		21.7	Ref	
	Yes	57.0	2.80 (1.98 to 3.98)	<0.001	59.8	2.36 (1.69 to 3.31)	<0.001
	X <sup>2</sup>	201.691			163.316		
	P value	<0.001			<0.001		
Deprivation quintile	(Most) 1	34.8	1.98 (1.31 to 2.99)	0.001	38.4	1.64 (1.13 to 2.38)	0.010
	2	24.8	1.31 (0.85 to 2.00)	0.220	27.0	1.07 (0.73 to 1.57)	0.720
	3	21.3	1.19 (0.78 to 1.83)	0.418	28.1	1.26 (0.87 to 1.84)	0.222
	4	19.8	1.17 (0.76 to 1.80)	0.477	23.5	1.00 (0.68 to 1.46)	0.979
	(Least) 5	12.9	Ref	0.010	18.1	Ref	0.330
	X <sup>2</sup>	54.741			42.168		
Activity limitation	No	17.5	Ref	0.001	19.9	Ref	<0.001
	A little	28.4	1.61 (1.14 to 2.28)	0.007	36.6	2.52 (1.84 to 3.46)	<0.001
	A lot	38.6	1.99 (1.36 to 2.90)	<0.001	46.8	3.20 (2.25 to 4.57)	<0.001
	X <sup>2</sup>	66.202			103.383		
	P value	<0.001			<0.001		
Sex	Male	19.7	Ref		21.5	Ref	
	Female	24.9	1.16 (0.90 to 1.50)	0.251	31.3	1.56 (1.24 to 1.98)	<0.001
	X <sup>2</sup>	7.106			23.036		
	P value	0.008			<0.001		
Age group	18–29	31.0	3.24 (2.01 to 5.23)	<0.001	34.3	2.95 (1.89 to 4.61)	<0.001
	30–49	27.9	2.84 (1.86 to 4.33)	<0.001	32.1	2.83 (1.92 to 4.17)	<0.001
	50–69	18.6	1.23 (0.82 to 1.84)	0.317	24.6	1.50 (1.04 to 2.16)	0.032
	70+	14.8	Ref	<0.001	17.6	Ref	<0.001
	X <sup>2</sup>	40.571			36.286		
Ethnicity	White	22.3	Ref		26.0	Ref	
	Ethnic minorities§	28.9	1.21 (0.69 to 2.12)	0.499	45.8	2.48 (1.51 to 4.07)	<0.001
	X <sup>2</sup>	2.012			15.824		
	P value	0.156			<0.001		

 \* $\chi^2$ .

†Binary logistic regression.

‡P values in ref rows are the overall p values for the category.

§ Excluding white minorities.

ACE, adverse childhood experiences; AOR, adjusted OR.

**Table 3** Bivariate relationships between self-reported negative impacts and ACE count and participant characteristics

		Proportion reporting rising costs of living had had a negative impact on:				
		Mental health	Physical health	Family relationships	Violence and ASB	Community support
		%	%	%	%	%
All		44.5	19.0	16.7	15.6	7.9
ACE count	0	34.4	11.8	9.3	10.6	5.0
	1	45.7	19.9	15.7	15.7	8.9
	2–3	59.9	28.1	27.4	22.6	10.6
	4+	74.5	43.1	42.6	32.4	17.6
	X <sup>2</sup>	145.041	127.492	163.346	73.757	42.459
	P value	<0.001	<0.001	<0.001	<0.001	<0.001
Low household income	No	38.8	14.4	14.0	13.4	6.3
	Yes	62.3	33.7	25.3	22.6	12.9
	X <sup>2</sup>	76.454	82.719	31.359	21.900	20.354
	P value	<0.001	<0.001	<0.001	<0.001	<0.001
Economic inactivity	No	39.5	15.3	12.5	13.5	6.3
	Yes	75.8	43.0	43.4	28.9	17.6
	X <sup>2</sup>	117.672	110.047	151.369	39.544	38.493
	P value	<0.001	<0.001	<0.001	<0.001	<0.001
Deprivation quintile	(Most) 1	51.7	23.8	22.4	18.8	8.3
	2	52.9	19.9	20.7	15.8	8.7
	3	42.6	18.2	15.1	15.3	6.8
	4	41.7	21.1	16.6	13.5	8.2
	(Least) 5	34.4	12.7	9.3	15.0	7.5
	X <sup>2</sup>	35.768	16.846	28.585	4.244	1.240
	P value	<0.001	0.002	<0.001	0.374	0.872
Activity limitation	No	39.2	11.0	14.3	13.1	6.4
	A little	50.8	28.7	16.0	21.8	10.6
	A lot	60.7	43.9	28.2	20.0	11.4
	X <sup>2</sup>	49.253	185.328	31.867	19.706	12.095
	P value	<0.001	<0.001	<0.001	<0.001	0.002
Sex	Male	40.5	15.1	14.0	14.1	8.3
	Female	47.8	22.4	18.9	16.9	7.5
	X <sup>2</sup>	9.833	16.087	8.134	2.690	0.386
	P value	0.002	<0.001	0.004	0.101	0.534
Age group	18–29	50.2	21.4	22.5	19.9	10.3
	30–49	54.7	19.1	24.4	17.9	9.4
	50–69	41.3	20.0	12.8	12.6	7.1
	70+	30.4	16.2	7.2	13.7	5.1
	X <sup>2</sup>	66.580	3.533	67.221	11.407	9.384
	P value	<0.001	0.316	<0.001	0.010	0.025
Ethnicity	White	44.2	18.7	16.6	15.5	7.6
	Ethnic minorities*	50.6	26.5	18.1	18.1	14.5
	X <sup>2</sup>	1.323	3.138	0.117	0.390	5.192
	P value	0.250	0.077	0.732	0.532	0.023

\*Excluding white minorities.

ACE, adverse childhood experiences; ASB, antisocial behaviour.

**Table 4** Adjusted ORs for self-reported negative outcomes by ACE count and participant characteristics

	Mental health		Physical health		Family relationships		Violence and ASB		Community support	
	AOR (95% CIs)	P	AOR (95% CIs)	P	AOR (95% CIs)	P	AOR (95% CIs)	P	AOR (95% CIs)	P
ACE count										
0	Ref	***	Ref	***	Ref	***	Ref	***	Ref	**
1	1.42 (1.09 to 1.85)	*	1.72 (1.21 to 2.45)	**	1.58 (1.09 to 2.30)	*	1.49 (1.04 to 2.14)	*	1.66 (1.03 to 2.67)	*
2-3	2.25 (1.68 to 3.01)	***	2.20 (1.55 to 3.14)	***	2.87 (2.00 to 4.11)	***	2.12 (1.48 to 3.03)	***	1.82 (1.11 to 2.97)	*
4+	3.31 (2.29 to 4.78)	***	3.44 (2.35 to 5.03)	***	4.26 (2.90 to 6.25)	***	2.95 (2.01 to 4.33)	***	2.69 (1.63 to 4.43)	***
Low household income										
No	Ref		Ref		Ref		Ref		Ref	
Yes	2.22 (1.72 to 2.87)	***	1.92 (1.44 to 2.55)	***	1.51 (1.11 to 2.07)	*	1.43 (1.06 to 1.93)	*	1.80 (1.22 to 2.66)	**
Economic inactivity										
No	Ref		Ref		Ref		Ref		Ref	
Yes	2.17 (1.53 to 3.07)	***	1.62 (1.14 to 2.32)	**	2.60 (1.81 to 3.72)	***	1.78 (1.23 to 2.58)	**	1.90 (1.20 to 3.03)	**
Deprivation										
(Most) 1	1.28 (0.93 to 1.78)	ns	1.18 (0.77 to 1.83)	ns	1.58 (0.99 to 2.52)	ns	0.88 (0.58 to 1.33)	ns	0.63 (0.36 to 1.12)	ns
2	1.58 (1.15 to 2.18)	**	1.20 (0.77 to 1.84)	ns	1.74 (1.10 to 2.75)	*	0.81 (0.53 to 1.23)	ns	0.81 (0.47 to 1.41)	ns
3	1.07 (0.78 to 1.47)	ns	1.06 (0.69 to 1.64)	ns	1.27 (0.80 to 2.04)	ns	0.85 (0.56 to 1.27)	ns	0.66 (0.37 to 1.16)	ns
4	1.07 (0.78 to 1.48)	ns	1.39 (0.91 to 2.12)	ns	1.46 (0.91 to 2.32)	ns	0.71 (0.47 to 1.08)	ns	0.84 (0.48 to 1.44)	ns
(Least) 5	Ref	*	Ref	ns	Ref	ns	Ref	ns	Ref	ns
Activity limitation										
No	Ref	***	Ref	***	Ref	**	Ref	*	Ref	ns
A little	1.75 (1.31 to 2.33)	***	3.04 (2.17 to 4.26)	***	1.06 (0.72 to 1.57)	ns	1.63 (1.16 to 2.30)	**	1.57 (0.99 to 2.49)	ns
A lot	2.25 (1.61 to 3.15)	***	5.35 (3.72 to 7.69)	***	1.84 (1.23 to 2.75)	**	1.22 (0.82 to 1.81)	ns	1.45 (0.87 to 2.42)	ns
Sex										
Male	Ref		Ref		Ref		Ref		Ref	
Female	1.18 (0.96 to 1.44)	ns	1.51 (1.16 to 1.97)	**	1.25 (0.95 to 1.64)	ns	1.14 (0.87 to 1.48)	ns	0.80 (0.57 to 1.14)	ns
Age (years)										
18-29	2.67 (1.82 to 3.91)	***	1.91 (1.17 to 3.13)	*	2.73 (1.58 to 4.73)	***	1.31 (0.81 to 2.10)	ns	1.88 (0.96 to 3.69)	ns
30-49	3.59 (2.58 to 4.98)	***	1.70 (1.11 to 2.60)	*	3.45 (2.13 to 5.59)	***	1.24 (0.82 to 1.86)	ns	1.81 (1.00 to 3.28)	ns

Continued



Table 4 Continued

	Mental health		Physical health		Family relationships		Violence and ASB		Community support	
	AOR (95% CIs)	P value*	AOR (95% CIs)	P value*	AOR (95% CIs)	P value*	AOR (95% CIs)	P value*	AOR (95% CIs)	P value*
50–69	1.66 (1.22 to 2.27)	**	1.40 (0.95 to 2.07)	ns	1.40 (0.86 to 2.27)	ns	0.78 (0.52 to 1.17)	ns	1.28 (0.72 to 2.29)	ns
70+	Ref	***	Ref	ns	Ref	***	Ref	*	Ref	ns
Ethnicity										
White	Ref		Ref		Ref		Ref		Ref	
Ethnic minorities†	1.09 (0.67 to 1.77)	ns	2.00 (1.13 to 3.52)	*	0.93 (0.50 to 1.73)	ns	1.19 (0.66 to 2.17)	ns	2.16 (1.11 to 4.22)	*

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001.  
 †P values in ref rows are the overall p values for the category.  
 ‡Excluding white minorities.  
 ACE, adverse childhood experience; AOR, adjusted OR; ASB, antisocial behaviour; ns, not significant; Ref, reference category.

to report negative impacts on violence and ASB (AOR 2.95), mental health (AOR 3.31) and physical health (AOR 3.44) and over four times more likely to report negative impacts on family relationships (AOR 4.26). Low household income and economic inactivity were also associated with all self-reported negative impacts, with AORs ranging from 1.43 (low household income, negative impact on violence and ASB) to 2.60 (economic inactivity, negative impact on family relationships). Being female was associated with self-reported negative impacts on physical health; other than white ethnicity was associated with self-reported negative impacts on physical health and community support; and younger age was associated with self-reported negative impacts on family relationships, physical health and mental health, with the highest odds for mental health seen in the 30–49 years age group (vs age 70+, AOR 3.59). Activity limitation was associated with all negative impacts except community support with the increase in odds being particularly notable for negative impacts on physical health (limited a little, AOR 3.04; limited a lot, AOR 5.35; [table 4](#)).

## DISCUSSION

The cost-of-living crisis has imposed substantial burdens on individuals and families around the world, with major implications for health. Financial difficulties can reduce individuals' access to essentials, such as healthy nutrition and warm homes, directly impacting physical and mental health. However, concerns relating to inadequate finances or stressors associated with a worsening financial position may also impact well-being even before life limiting poverty is reached. Understandably, harms associated with rising costs of living are recognised to be disproportionately impacting populations with existing economic vulnerabilities and consequently may widen inequalities. However, less is known about how other factors may influence individuals' coping and health outcomes. Using a general population sample of adults in Wales, we found that ACEs were reported by individuals from all socioeconomic categories, although their prevalence was higher in individuals with socioeconomic vulnerabilities, including low household income, economic inactivity, residential deprivation and long-term health problems ([table 1](#)). Such findings are consistent with previous studies identifying links between life opportunities and having a history of ACEs.<sup>4 5</sup> In addition, results here identify strong associations between higher levels of reported ACEs and perceived inability to cope financially during the cost-of-living crisis along with greater self-reported negative impacts from the crisis on mental and physical health, relationships and local community characteristics (ie, increased hostility and reduced community support). Critically, the strong relationships between ACEs and cost-of-living impacts remained even after controlling for income and other socioeconomic factors ([tables 2 and 4](#)).

Biomolecular mechanisms through which exposure to ACEs can influence health and social well-being across the life-course are increasingly being described.<sup>25 26</sup> Of particular relevance here, neurological and endocrinological changes related to ACEs can affect individuals' resilience to sources of stress across the life course, contributing to a larger impact of stressful events on mental health, increased perceptions of isolation and potential repercussions on physical health and well-being<sup>27</sup>; including through adoption of harmful coping mechanisms such as alcohol and other substance use. ACEs have also been linked to various aspects of emotions and personality, including negative affect,<sup>28</sup> which relates to a general sense of feeling that things are not going well. Further, individuals with ACEs can report lower trust in people and support services,<sup>29 30</sup> and thus potentially lower social capital in times of crisis. Such research is consistent with our finding that individuals with more ACEs, but similar levels of poverty, were more than three times (4+ vs 0 ACEs) as likely to think they could not cope financially and just under three times more likely to report experiencing substantial distress and anxiety emanating from the crisis (table 2). Early childhood trauma can also impact cognitive development, including aspects such as critical thinking, problem-solving, memory, decision-making, risk perception and reward processing.<sup>31</sup> Such effects may influence financial well-being specifically through poorer financial planning, resource management and decision-making, as well as reduced financial literacy. Although research linking ACEs to financial decision-making remains scant, a growing body of evidence indicates relationships with health decision-making. Thus, ACEs have been associated with lower engagement with protective health services such as cancer screening and vaccination, and reduced use of health insurance.<sup>32-34</sup> Evolutionary theories link early life adversity to 'fast' life strategies characterised by impulsivity, risk taking and future discounting, with short-term life views prioritising immediate rewards over long-term goals.<sup>35</sup> Along with health and financial behaviours, such strategies may affect attitudes towards education and employment, impeding opportunities for gaining and effectively managing material resources throughout life.

The number of individuals affected by ACEs is considerable. In this study, we found almost half of respondents had suffered at least one ACE and over one in ten had suffered 4+ ACEs. These figures are consistent with previous studies in the UK and other countries.<sup>21 36</sup> Importantly, our results found significant increases in self-reported poorer mental and physical health associated with the cost-of-living crisis even in individuals reporting exposure to one ACE. Similarly, family relationships and perceptions of safety and support in the community were also more adversely affected by rising costs of living in those with only one ACE. Such results suggest the interaction between ACEs and cost-of-living stressors may represent

a substantial widespread threat to public health. Despite an increasing evidence-base describing the benefits of trauma informed services, little attention has been given to how such approaches could help identify and support those most at risk of harm from the cost-of-living crisis. Our findings suggest that financial and related services such as those supporting financial literacy, debt management, and food and housing security would benefit from being trauma informed. For example, studies in the USA suggest that trauma-informed financial education and empowerment programmes can improve economic security for low-income families.<sup>37 38</sup> In the longer term, results here suggest that greater investment in evidenced-based interventions to prevent ACEs<sup>39</sup> would support the development of individuals and communities more resilient to the impact of crises on physical and mental health. Critically, while a history of ACEs represented a risk of harm through the cost-of-living crisis in our study, even in those with the highest level of ACEs around half believed they would be able to cope financially and reported no substantial distress and anxiety from rising costs of living; demonstrating resilience and that ACEs are probabilistically and not deterministically related to poorer outcomes.

Results here relate to a national survey undertaken in Wales and a wide range of support has been provided to the Welsh population during the cost-of-living crisis. This includes universal support with energy costs and targeted financial support for vulnerable groups.<sup>40</sup> Understandably, the overriding vulnerability considered during a financial crisis is deprivation. Supportive of this approach, we identified strong relationships between perceived inability to cope financially during the crisis and associated distress and anxiety and socioeconomic vulnerabilities including low household income and economic inactivity. However, such relationships with ACEs (0vs 4+ACEs) were of a comparable magnitude (tables 2 and 4). Moreover, when considering perceived impacts of the crisis on changes in physical and mental health, family relationships and local safety and community support, increases in the likelihood of self-reported negative outcomes associated with high ACEs consistently exceeded those associated with low household income and economic inactivity (table 4). Consequently, definitions of vulnerability during crises and communications with health, education and other services on who is most likely to be adversely impacted should consider childhood adversity and history of trauma.

Our study had a number of limitations that should be borne in mind when interpreting results. All survey questions were self-reported, and thus are subject to bias in how participants responded. We measured various markers of socioeconomic deprivation, including residential area-level deprivation (based on postcode, which was verified with participants by interviewers) and self-reported employment status and household income. However, our measure of low household income was affected by around one in three



survey participants either not knowing (n=391) or preferring not to report (n=215) their annual household income; consequently, these individuals were categorised in the comparator group for individuals who disclosed an annual income of <£20 000. ACEs were measured retrospectively with a tool that has been widely used in both general and high-risk populations and for which acceptable psychometric properties have been shown in various population groups.<sup>41–44</sup>

The short ACE tool is restricted by the limited range of ACEs it covers and here we used the initial version of the tool which did not include physical and emotional neglect. A previous study in the general Welsh population found inclusion of these ACEs made minimal difference to ACE counts with most individuals who reported them also reporting other ACEs.<sup>45</sup> Retrospective measurement of ACEs may be subject to recall bias as well as willingness to report; however, the prevalence of ACEs reported by the sample was equivalent to that reported in previous studies in Welsh and other UK populations.<sup>21</sup> Our temporal focus on the cost-of-living crisis meant there were no validated questions available to measure our outcomes. Thus questions were developed to build on other national population surveys measuring impacts of the cost of living<sup>24</sup> and in consultation with public health experts. Outcome measurements were based on single questions and were subjective, thus they measured perceived negative impacts of the cost-of-living crisis on health, well-being and community rather than independently measured changes. Those with ACEs and with other socioeconomic vulnerabilities may have had a greater inclination to describe more negative outcomes, and this would be an important area for further study. While the sample was designed to be broadly representative of the Welsh general population and compliance was comparable to other ACE surveys (49%), we cannot identify any impacts that selection bias may have had on findings and thus how generalisable our findings are to broader populations. Importantly, only 4.6% of our sample reported other than white ethnicity (compared with 6.2% in the general Welsh population<sup>46</sup>), with small numbers preventing more detailed analysis of ethnicity. While no differences in ACE exposure were identified between white and other than white participants, this binary categorisation may mask differences between specific ethnic groups. Regardless of ACEs, other than white participants were more likely to report that rising costs of living were causing them substantial distress and anxiety, and to report the cost-of-living crisis was having a negative impact on their physical health and levels of support in the community. Further work to examine differences in ACE exposure and its impacts within ethnic groups is warranted. Our study did not measure relationship or marital status, but this may play an important role in individuals' financial well-being and resilience during economic crises. Females reported higher levels of distress and

anxiety due to rising costs of living and future research would benefit from examining the mediating impact of relationship factors. Finally, our survey was cross-sectional and consequently findings do not necessarily indicate causal relationships between ACEs and the outcomes measured.

## CONCLUSION

Results in this study suggest a history of ACEs may play an important part in how individuals perceive and are affected by population crises. With continued global uncertainty not only relating to financial pressures but also international conflict and climate change it is unlikely that the cost-of-living crisis will be the only source of substantive trauma even within current generations. While political and scientific attention is being given to these international issues, less attention is directed to how individuals and communities may become more resilient to some of their impacts on health and well-being. Preventing ACEs is a cost-saving measure that could save countries billions of dollars annually — with studies suggesting the costs of ACEs can be equivalent to around 3% of countries' gross domestic product.<sup>47 48</sup> This alone may help avert further financial crises but reducing ACEs would also potentially leave populations more resilient to crises that arise from other causes. With the prevalence of ACEs even higher in some low-income and middle-income countries,<sup>49</sup> where the impact of global crises is often even worse, the benefits of preventing childhood trauma may be even greater. A continued focus on poverty and inequality as sources of vulnerability during crises remains of critical importance. However, deprived and other communities are far from homogeneous and include both individuals who have suffered high levels of ACEs as well as those who have avoided such experiences or moderated their impact through supportive relationships and services. Preparation for further crises needs to consider how best to support those left vulnerable through childhood adversity. However, it should also recognise that others within communities will have eluded or developed resilience against such trauma and consequently are assets to develop for any crises to come.

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