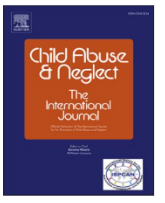
Child Abuse & Neglect 117 (2021) 105067

Contents lists available at ScienceDirect

Child Abuse & Neglect

journal homepage: www.elsevier.com/locate/chiabuneg



Adverse childhood experiences in New Zealand and subsequent victimization in adulthood: Findings from a population-based study

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ARTICLE INFO

Keywords:
Adverse childhood experiences
Prevalence
Association
Intimate partner violence
Non-partner violence
New Zealand

ABSTRACT

Background: Adverse childhood experiences (ACEs) are widespread and are associated with adverse outcomes in later life, yet few studies have explored their prevalence and consequences in New Zealand.

Objectives: To provide prevalence estimates of ACEs in New Zealand using a large sample of adults, and to explore the associations between ACEs and experience of violence by intimate partners and non-partners in adulthood.

Participants and setting: 2,887 participants (1464 female, 1423 male) from the 2019 New Zealand Family Violence Survey, a population based study conducted in New Zealand between March 2017–March 2019.

Methods: Descriptive statistics for prevalence of each of the eight ACE types, and cumulative ACE scores were estimated across sociodemographic groups. Multivariate logistic regression models were developed to assess association between ACEs and five IPV and two non-partner violence variables.

Results: ACEs were prevalent and co-occurring, with 55 % (95 % CI 53.2 %–56.8 %) of respondents reporting having experienced at least one ACE and 11.6 % (95 % CI 10.4 %–12.8 %) reporting at least four ACEs before the age of 18. Those who were younger, had lower socioeconomic status, and who identified as Māori reported higher prevalence of ACEs. Exposure to any ACE was significantly associated with later exposure to IPV and non-partner violence.

Conclusions: The findings provide the first comprehensive assessment of the prevalence of ACEs in the New Zealand population. They suggest that prevention of childhood trauma, maltreatment, and family dysfunction remain important and interconnected public health goals that need to be addressed to support the wellbeing of children and adults.

1. Introduction

Achieving well-being for children is a national priority, with the aspirational goal for New Zealand to "become the best place in the

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https://doi.org/10.1016/j.chiabu.2021.105067
Received 10 December 2020; Received in revised form 30 March 2021; Accepted 4 April 2021
Available online 18 April 2021

world for children and young people" (Department of the Prime Minister & Cabinet, 2019). In the United States, documentation of the scale and consequences of Adverse Childhood Experiences (ACEs) has been transformational to developing public health understanding of broader forms of well-being for children (Felitti et al., 2019). Hallmarks of this work include assessment of the widespread prevalence of ACEs in the general population (Merrick, Ford, Ports, & Guinn, 2018) and in health care settings (Pathak & Grimes, 2019), and research documenting how cumulative exposure to ACES is linked with an extensive range of chronic health outcomes (Felitti et al., 1998, 2019). This knowledge has been utilized to leverage the development of prevention and response systems in locations such as health centers (Riedl et al., 2020), and in schools (Chafouleas, Johnson, Overstreet, & Santos, 2015).

Strengths of the ACE Study include its ability to assess a broad range of early childhood traumatic stressors, including experience of abuse, neglect and other forms of household dysfunction (e.g., parent with mental illness or substance abuse, or parental incarceration). It documents how exposure to these experiences are associated with an extensive array of clinical, public health, and social problems throughout the life span (Clarkson Freeman, 2014; Ehlert, 2013), mediated through pathways of social, emotional, biological and cognitive impairments (Riem, Alink, Out, Van Ijzendoorn, & Bakermans-Kranenburg, 2015; Teicher et al., 2003).

Both the World Health Organization and the US Centers for Disease Control and Prevention have highlighted the importance of extending assessment of ACEs to other countries, through building a framework for global surveillance of the ACEs (Anda, Butchart, Felitti, & Brown, 2010). In New Zealand, to date, there has been limited assessment of the prevalence of ACEs (Reuben et al., 2016; Walsh, Joyce, Maloney, & Vaithianathan, 2019). One large prospective birth cohort study of 5,500 children at age 4 ½ years indicated that approximately half had experienced one ACE, and 2.6 % had experienced 4 or more ACEs (Walsh, Joyce et al., 2019). However, this estimate will be an under-report, as the full childhood exposure period has not been completed, and assessment of the full range of ACEs (particularly child sexual abuse) was not undertaken. Other assessments of child abuse in New Zealand have focused on determining prevalence of single issues, e.g., child sexual or physical abuse (Fanslow, Robinson, Crengle, & Perese, 2007; Fergusson, Boden, & Horwood, 2008), rather than the full range of adversity that may impact on children. The high rates obtained for these single issues, however, make it clear that much needs to be done to achieve the goal of well-being for children, with one in four girls reporting experience of child sexual abuse before the age of 15 (Fanslow et al., 2007).

Descriptive epidemiological studies of ACEs add value by outlining the association of ACEs experienced by different socio-economic groups, information which is fundamental to bringing attention to inequities (Merrick et al., 2018). Given the long-term impacts associated with ACEs, these disparities can compound across the life-course (Merrick et al., 2018), and disproportionately impact those who experience the highest ACEs (Walsh, McCartney, Smith, & Armour, 2019). Knowledge of distribution across the population is important, as it can guide provision of additional resources to population groups, help determine which sectors may be helpful to engage to mitigate negative outcomes, and further direct attention to the importance of addressing structural inequities and practices of discrimination.

Importantly, previous international studies have also documented the co-occurrence of ACEs and later exposure to other forms of violence, including victimization from (Mair, Cunradi, & Todd, 2012) and perpetration of intimate partner violence (Brown, Perera, Masho, Mezuk, & Cohen, 2015; Fonseka, Minnis, & Gomez, 2015). Understanding these links across the life-course has important implications for prevention (Montalvo-Liendo et al., 2015), and may be helpful to counteract policy and practice responses that artificially compartmentalize these issues (Murphy, Paton, Gulliver, & Fanslow, 2013; Murphy, Paton, Gulliver, & Fanslow, 2013).

The objectives of this study are to provide prevalence estimates of adverse childhood experiences (ACEs) in New Zealand, and to explore the associations between ACEs and experience of violence by intimate partners and by non-partners in adulthood.

2. Methods

2.1. Data source

Data was taken from 2019 New Zealand Family Violence Survey/He Koiora Matapopore, a population based study conducted in three regions (Waikato, Northland and Auckland) in New Zealand between March 2017–March 2019. Full details of the study methods are published elsewhere (Fanslow, Gulliver, Hashemi, Malihi, & Mcintosh, 2021) but are summarized briefly here. Eligibility requirements for participants were: age 16 years and over, speaking conversational English, sleeping in the property at least four nights a week on average and living at the property for at least one month prior to data collection. Both women and men were recruited for the study.

2.2. Sampling method

Meshblocks (the smallest geographical unit used for census surveys) were selected by Statistics NZ. Within each meshblock, a random starting point was identified, and every second and sixth house within the meshblock was selected. Non-residential and short-term residential properties, rest homes and retirement villages were excluded. Specific meshblocks were allocated to each gender for safety measures. In addition, only one randomly selected person per household could participate in the study.

2.3. Data collection

Data was collected through face-to-face interview using the WHO Multi-Country Study on Violence Against Women (VAW) questionnaire (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2005). The instrument was adapted to include men and was pre-tested with a convenience sample before data collection started. Comprehensive training of all interviewers was conducted to ensure valid

data collection, and the safety of interviewers and respondents. For quality assurance purposes regular meetings, audits and reviews of completed interviews were conducted. Interviews were conducted privately with no one aged 2 years or over present. All respondents provided written consent prior to interview.

2.4. Study sample

Of 9,568 approached households, 1,532 were ineligible to participate. Of 8,036 eligible households, 1,804 (22.4 %) refused to

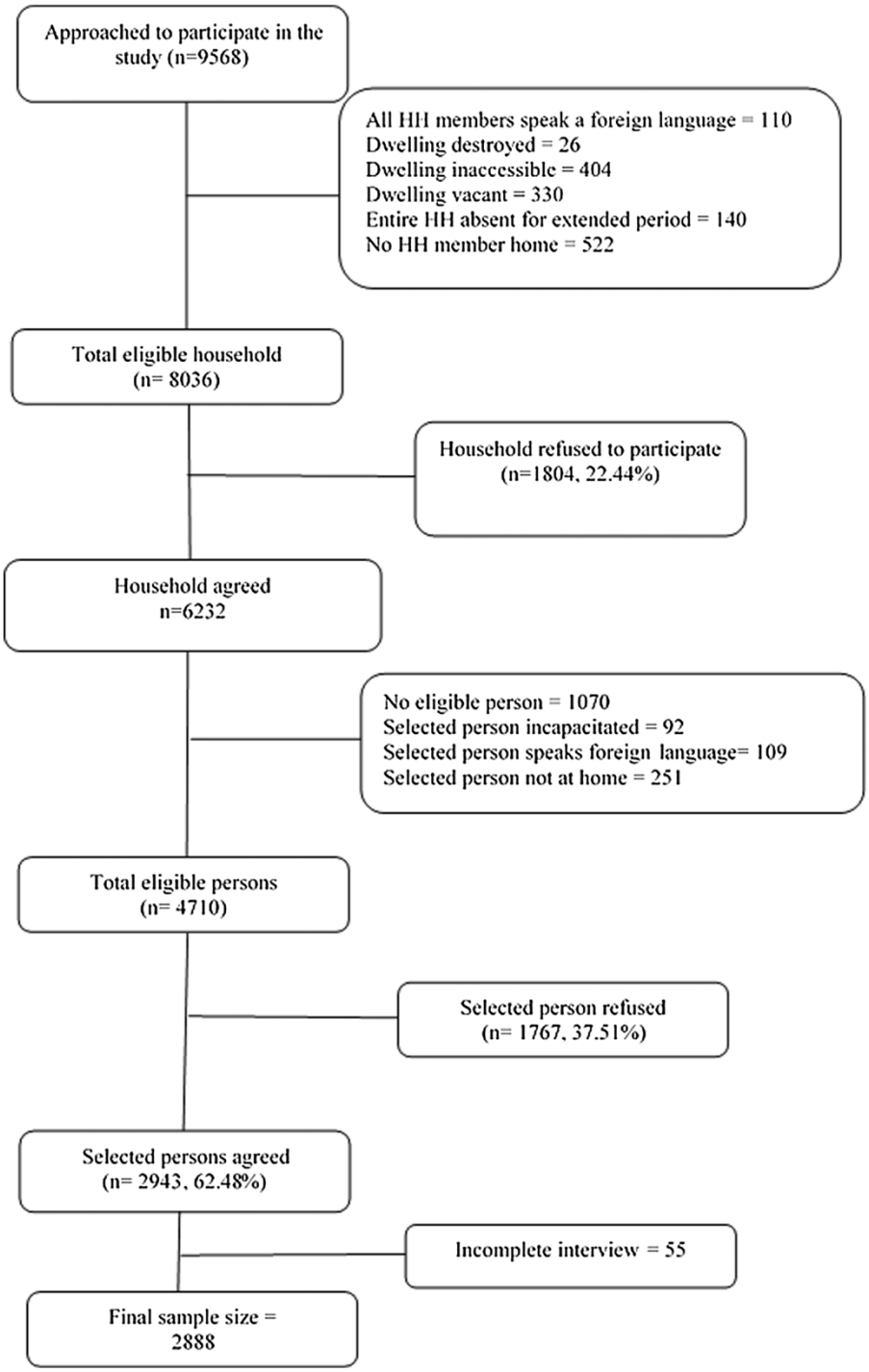

Fig. 1. 2019 New Zealand Family Violence Survey: Flowchart of household and individual recruitment outcomes.

participate. Of 6,232 households who agreed to participate, 1,271 participants were ineligible (mainly due to not speaking English or being incapacitated). A further 251 were not at home after several attempts. Of the remaining 4,710 eligible participants, 1,767 (37.5 %) refused to participate. After excluding incomplete interviews (n = 55), 2,888 participants remained in the study (1464 female and 1423 male, 1 other) (Fig. 1). For IPV analyses, only ever-partnered respondents (n = 2786) were included, equivalent to almost 97 % of respondents (1431 female, 1355 male). Demographic characteristics of the study sample stratified by gender are presented in Table 2.

2.5. Representativeness

The ethnicity, marital status, and deprivation level distribution of the sample were closely comparable to the general population,

Table 1
Definition of ACE types measured in the 2019 New Zealand Family Violence Survey.

Variable	Definition
Demographic characteristics	
Employment status	What is your main daily occupation? Responses were grouped into three categories: Unemployed (not working and housework), Student, and Employed (currently working or retired)
Food security status	Do you ever worry about not having enough money to buy food? We scored responses of "never" as 0 and all other responses (Occasionally/Sometimes/Often/All the time) as 1.
Area deprivation	Taken from NZ Index of Multiple Deprivation (IMD) (Exeter et al., 2017) which used a combination of routinely collected data from government departments and census data in seven domains (i.e. employment, income, crime, housing, health, education, and access to services) to develop a measure of deprivation at the neighborhood level. Participants were classified in three groups: living in least, moderately or most deprived area.
ACE_Abuse[a]	
Emotional abuse	While you were growing up, in your first 18 years of life: Did a parent or adult in your home ever swear at you, insult you, or put you down?
Physical abuse	Before age 18, did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include smacking.
Sexual abuse	Before the age of 15, do you remember if anyone ever touched you sexually, or made you do something sexual that you didn't want to do?
ACE_Household dysfunction[b]	All of the questions in this section were introduced with the phrase "While you were growing up during your first 18 years of life. . ."
Intimate partner violence witnessing	Was your mother or step mother ever slapped, hit, kicked, punched or beaten up?
Household Substance abuse	Did you live with anyone who was a problem drinker or alcoholic? Did you live with anyone who used illegal street drugs or who abused prescription medications?
Household mental illness	Did you live with anyone who was depressed, mentally ill, or suicidal?
Parental separation or divorce	Were your parents separated or divorced?
Incarcerated household member	Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?
Ever-partnered	If respondent had ever been married, lived with, or were currently with a regular sexual partner.
Intimate partner violence (IPV)	
Physical IPV	Participants were categorised as experiencing lifetime physical IPV if they reported having experienced one or more of the following acts: Has any partner ever a) slapped you or thrown something at you that could hurt you?, b) pushed or shoved you or pulled your hair?, c) hit you with their fist or with something else that could hurt you? d) kicked, dragged or beaten you up? e) choked or burnt you on purpose?, f) threatened to use or actually used a gun, knife, or other weapon against you.
Sexual IPV	Participants were categorised as experiencing lifetime sexual IPV if they reported having experienced one or more of the following acts: Has any partner ever a) physically forced to have sexual intercourse when you did not want to?, b) have sexual intercourse because they were afraid of what their partner might do or c) being forced to do something sexual that they found degrading or humiliating.
Psychological IPV	Participants were categorised as experiencing lifetime psychological IPV if they reported having experienced two or more of the following acts: Has any current or previous partner ever: a) Insulted you or made you feel bad about yourself? b) Said or did something that made you feel humiliated in front of other people? c) Did things that made you feel scared or intimidated? d) Threatened to harm you or someone you care about? e) Destroyed things that are important to you? We reported on prevalence of two or more acts of psychological IPV to distinguish this from a one-off incident, as 50 % of the sample reported experiencing at least one act of this IPV.
Controlling behaviour	Participants were categorised as experiencing lifetime controlling behaviour if they reported having experienced one or more of the following acts: Has any current or previous partner ever: a) Stopped you from seeing your friends?, b) restricted contact with your family?, c) insisted on knowing where you are in a way that made you feel controlled or afraid?, d) stopped you from getting health care?
Economic IPV	Participants were categorised as experiencing lifetime economic IPV if they reported having experienced one or more of the following acts: Has any partner ever a) pressured you into paid work that you did not want to do?, b) taken your earnings or savings from you against your will?, c) refused to give you money for household expenses, even when they have money for other things?, d) failed to arrive for, or interfered with childcare when you needed to be at work?, e) Have you ever given up / refused a job for money because your partner did not want you to work?
Non-partner violence	
Physical non-partner abuse	Since the age of 15, has anyone (other than your partner) ever hit, beaten or done anything else to hurt you physically?
Sexual non-partner abuse	Since the age of 15, has anyone (other than your partner) ever forced you to have sex or to perform a sexual act when you did not want to (by threatening you, holding you down or putting you in a situation that you could not say no)?

[a,b]Response options were yes (1) and no (0).

however the sample was under-represented for younger women (ages 16–29) and slightly over-represented for those over 60 years of age.

2.6. Ethics approval

Ethics approval was received from The University of Auckland Human Participants Ethics Committee (reference number 2015/018244).

2.7. Measures

2.7.1. Exposure of interest: ACEs

The main exposure variable for the current study was the ACEs scale, adapted from the US ACE Study (Merrick et al., 2018). The ACE scale consists of 11 questions collapsed into 8 dichotomously coded ACE categories which included two main divisions: abuse or maltreatment (three categories: physical abuse, emotional abuse, sexual abuse) and household dysfunction (five categories: IPV witnessing, household substance use, household mental illness, parental separation or divorce, and incarcerated household member) (See Table 1 for definition of each ACE). Respondents were asked if they were impacted by these adverse experiences prior to age 18. The only exception was sexual abuse which was asked for the period before age 15.

We also created an "ACE Score" variable by adding the dichotomous scores of each ACE category to record an overall ACE Score for each respondent (range: 0–8). Responses were grouped into four categories: 0, 1, 2, 3, and 4 or more ACEs. This ensured adequate sample sizes in each group while maintaining differentiation between individuals who experienced a high or low number of ACEs. Additionally, we created a binary variable, "Any ACE", which captured whether a respondent had experienced any of the eight types of ACE.

2.7.2. Outcome of interest: violence exposure as an adult

We focused on lifetime exposure to five types of IPV (physical IPV, sexual IPV, psychological IPV, controlling behaviour, economic IPV) and two types of non-partner violence (physical and sexual) for these analyses. The survey asked about ever having experienced

Table 2
Demographic characteristics of the 2019 New Zealand Family Violence Survey respondents.

Sociodemographic characteristics	Survey respondents		
	Female respondents n = 1464 n (%)	Male respondents n = 1423 n (%)	All n = 2887 n (%)
Age groups			
16–24	98 (6.7)	129 (9.1)	228 (7.9)
25–34	190 (13.0)	165 (11.6)	355 (12.3)
35–44	239 (16.3)	268 (18.9)	507 (17.6)
45–54	278 (19.0)	270 (19.0)	548 (19.0)
55–64	256 (17.5)	252 (17.7)	508 (17.6)
≥ 65	401 (27.4)	337 (23.7)	738 (25.6)
Ethnicity			
European	1021 (69.8)	963 (67.8)	1984 (68.8)
Māori	188 (12.9)	129 (9.1)	318 (11.0)
Pacific	71 (4.9)	88 (6.2)	159 (5.5)
Asian	160 (10.9)	218 (15.3)	378 (13.1)
MELAA	22 (1.5)	23 (1.62)	45 (1.6)
Personal income			
0–$49K	930 (68.4)	573 (41.7)	1504 (55.0)
$50–$74K	238 (17.5)	271 (19.7)	509 (18.6)
$75–$100K	115 (8.5)	223 (16.2)	338 (12.4)
>$100K	76 (5.6)	307 (22.3)	383 (14.0)
Educational attainment			
Primary or Secondary	600 (41.1)	629 (44.3)	1230 (42.7)
Tertiary	858 (58.8)	791 (55.7)	1649 (57.3)
Employment status			
Unemployed	241 (16.5)	90 (6.3)	331 (11.5)
Student	78 (5.3)	83 (5.8)	161 (5.6)
Employed /retired	1144 (78.2)	1248 (87.8)	2393 (82.9)
Area level deprivation			
Least deprived	424 (29.0)	365 (25.6)	789 (27.3)
Moderately deprived	595 (40.7)	648 (45.5)	1244 (43.1)
Most deprived	442 (30.2)	410 (28.8)	852 (29.5)
Food security			
Secure	1169 (80.2)	1183 (83.7)	2352 (81.9)
Insecure	289 (19.8)	230 (16.3)	520 (18.1)

Table 3
Prevalence estimates of measured ACE types by sociodemographic characteristics, the 2019 New Zealand Family Violence Survey.

Characteristics	Abuse			IPV witnessing	Household Substance abuse	Household mental illness	Parental separation/ divorce	Incarcerated household member
	Emotional n % (95% CI)	Physical n % (95% CI)	Sexual n % (95% CI)	n % (95% CI)	n % (95% CI)	n % (95% CI)	n % (95% CI)	n % (95% CI)
Total	837 29.2 (27.6–30.9)	511 17.8 (16.5–19.3)	502 18.3 (16.9–19.8)	451 15.8 (14.5–17.2)	570 20 (18.5–21.5)	547 19.1 (17.7–20.6)	645 22.5 (21–24.1)	107 3.7 (3.1–4.5)
Gender								
Female	437 30.1 (27.8–32.5)	274 18.9 (17–21)	357 26.0 (23.8–28.4)	261 18 (16.1–20.1)	326 22.6 (20.5–24.8)	348 24 (21.8–26.2)	347 23.9 (21.8–26.2)	60 4.2 (3.2–5.3)
Male	399 28.3 (26–30.7)	236 16.7 (14.9–18.8)	145 10.6 (9.1–12.4)	189 13.4 (11.7–15.3)	244 17.3 (15.4–19.4)	199 14.1 (12.4–16.0)	297 21.0 (19.0–23.2)	47 3.3 (2.5–4.4)
Pearson chi^2 (p value)	1.19 (0.2)	2.30 (0.1)	108.5 (0.001)	11.3 (0.001)	12.40 (0.001)	45.02 (0.001)	3.44 (0.06)	1.3 (0.2)
Age group, y								
16–24	97 42.5 (36.3–49.1)	41 18.0 (13.5–23.5)	24 11.1 (7.5–16.0)	43 18.9 (14.3–24.6)	53 23.3 (18.3–29.3)	53 23.2 (18.2–29.2)	88 38.8 (32.6–45.3)	25 11.0 (7.5–15.8)
25–34	128 36.1 (31.2–41.2)	63 17.7 (14.1–22.1)	48 14.2 (10.9–18.3)	54 15.2 (11.9–19.4)	79 22.4 (18.3–27.0)	84 23.7 (19.5–28.4)	120 33.8 (29.1–38.9)	24 6.8 (4.6–10.0)
35–44	160 31.8 (27.9–36.0)	80 15.9 (12.9–19.4)	81 16.8 (13.7–20.4)	85 16.9 (13.9–20.5)	100 19.9 (16.6–23.6)	101 20.1 (16.8–23.8)	131 26.1 (22.4–30.1)	17 3.4 (2.1–5.40
45–54	172 31.5 (27.7–35.5)	101 18.5 (15.4–22.0)	110 20.8 (17.6–24.5)	94 17.3 (14.3–20.7)	123 22.6 (19.3–26.4)	122 22.3 (19.0–26.0)	128 23.5 (20.1–27.2)	16 2.9 (1.8–4.7)
55–64	147 29.2 (25.3–33.3)	113 22.4 (19.0–26.3)	113 23.3 (19.7–27.3)	85 16.9 (13.8–20.4)	109 21.8 (18.4–25.6)	105 20.9 (17.5–24.6)	94 18.6 (15.5–22.3)	17 3.4 (2.1–5.4)
≥ 65	131 18.1 (15.4–21.1)	111 15.4 (12.9–18.2)	126 18.4 (15.7–21.5)	88 12.2 (10–14.8)	105 14.5 (12.1–17.3)	82 11.3 (9.2–13.8)	84 11.6 (9.5–14.1)	8 1.1 (0.5–2.2)
Pearson chi^2 (p value)	74 (0.001)	11.67 (0.04)	22.3 (0.001)	10.75 (0.056)	19.93 (0.001)	40.80 (0.001)	117.8 (0.001)	57.5 (0.001)
Ethnicity								
European	533 27.1 (25.1–29.1)	315 16.0 (14.4–17.7)	317 16.7 (15.1–18.4)	252 12.8 (11.4–14.4)	378 19.2 (17.5–21.0)	408 20.7 (19.0–22.5)	442 22.4 (20.6–24.3)	35 1.8 (1.3–2.5)
Māori	163 52.1 (46.5–57.6)	98 31.3 (26.4–36.7)	93 31.2 (26.2–36.7)	104 33.3 (28.3–38.8)	114 36.8 (31.6–42.3)	74 23.6 (19.2–28.6)	116 37.3 (32.1–42.8)	54 17.4 (13.5–22.0)
Pacific	53 33.5 (26.6–41.3)	39 24.7 (18.6–32.0)	31 21.1 (15.2–28.4)	38 24.2 (18.1–31.5)	34 21.7 (15.9–28.8)	19 12.0 (7.8–18.1)	34 21.5 (15.8–28.6)	12 7.7 (4.4–13.1)
Asian	75 19.9 (16.2–24.3)	50 13.3 (10.2–17.1)	50 14.2 (10.9–18.3)	45 12.0 (9.0–15.7)	35 9.4 (6.8–12.8)	33 8.8 (6.3–12.1)	44 11.7 (8.8–15.4)	3 0.8 (0.3–2.5)
MELAA	13 30.2 (18.3–45.6)	9 20.9 (11.2–35.8)	11 26.8 (15.4–42.5)	12 27.9 (16.5–43.2)	7 16.7 (8.1–31.3)	11 25.6 (14.7–40.7)	8 18.6 (9.5–33.2)	3 7.0 (2.2–19.7)
Pearson chi^2 (p value)	100.5 (0.001)	53.8 (0.001)	43.02 (0.001)	102.4 (0.001)	82.47 (0.001)	39.46 (0.001)	64.6 (0.001)	197.3 (0.001)
Personal income, $								
0-$49K	456 30.4 (28.1–32.7)	289 19.3 (17.3–21.3)	324 22.5 (20.4–24.7)	259 17.3 (15.5–19.3)	320 21.4 (19.4–23.6)	312 20.8 (18.8–22.9)	373 24.9 (22.7–27.1)	79 5.3 (4.3–6.5)
$50-$74K	152 29.9 (26.0–34.0)	88 17.3 (14.2–20.8)	69 14.3 (11.5–17.8)	75 14.8 (11.9–18.1)	89 17.5 (14.5–21.1)	91 17.9 (14.8–21.5)	100 19.6 (16.4–23.3)	11 2.2 (1.2–3.9)
$75-$100K	91 27.1 (22.6–32.1)	47 14 (10.7–18.1)	37 11.3 (8.3–15.2)	51 15.2 (11.7–19.4)	69 20.5 (16.5–25.2)	58 17.3 (13.6–21.7)	71 21.1 (17.1–25.8)	6 1.8 (0.8–3.9)

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Table 3 (*continued*)

Characteristics	Abuse			IPV witnessing	Household Substance abuse	Household mental illness	Parental separation/ divorce	Incarcerated household member
	Emotional n % (95% CI)	Physical n % (95% CI)	Sexual n % (95% CI)	n % (95% CI)	n % (95% CI)	n % (95% CI)	n % (95% CI)	n % (95% CI)
>$100K	105	68	44	43	68	65	69	4
	27.5 (23.2–32.2)	17.8 (14.3–22.0)	12.0 (9.0–15.7)	11.3 (8.5–14.9)	17.9 (14.3–22.1)	17.0 (13.6–21.1)	18.1 (14.5–22.3)	1.0 (0.4–2.8)
Pearson chi^2 (p value)	2.28 (0.5)	5.49 (0.1)	42.9 (0.001)	8.90 (0.03)	4.85 (0.1)	4.89 (0.1)	11.77 (0.008)	24.96 (0.001)
Educational attainment								
Primary or Secondary	367	227	208	212	256	205	311	63
	30.1 (27.6–32.8)	18.6 (16.6–20.9)	17.9 (15.8–20.2)	17.4 (15.4–19.7)	21.1 (18.9–23.5)	16.8 (14.8–19.0)	25.5 (23.2–28.1)	5.2 (4.1–6.6)
Tertiary	466	282	291	237	309	340	332	41
	28.4 (26.3–30.7)	17.2 (15.5–19.1)	18.5 (16.6–20.5)	14.5 (12.9–16.3)	18.9 (17.1–20.9)	20.8 (18.9–22.8)	20.3 (18.4–22.3)	2.5 (1.8–3.4)
Pearson chi^2 (p value)	0.96 (0.3)	0.96 (0.3)	0.15 (0.7)	4.58 (0.03)	2.06 (0.1)	7.07 (0.008)	11.06 (0.001)	14.06 (0.001)
Employment status								
Unemployed	116	77	89	71	94	78	102	29
	35.3 (30.3–40.6)	23.4 (19.1–28.3)	28.2 (23.5–33.5)	21.7 (17.6–26.5)	28.8 (24.2–34.0)	23.7 (19.4–28.6)	31.0 (26.2–36.2)	8.9 (6.2–12.5)
Student	57	25	20	26	30	38	45	11
	35.6 (28.6–43.4)	15.6 (10.8–22.1)	13.1 (8.6–19.4)	16.3 (11.4–23.0)	18.9 (13.5–25.7)	23.7 (17.7–31.0)	28.3 (21.8–35.8)	6.9 (3.8–12.0)
Employed /retired	664	409	392	354	446	431	498	67
	28 (26.2–29.8)	17.2 (15.8–18.8)	17.3 (15.8–18.9)	14.9 (13.6–16.4)	18.9 (17.3–20.5)	18.2 (16.7–19.8)	21.0 (19.4–22.7)	2.8 (2.2–3.6)
Pearson chi^2 (p value)	10.7 (0.005)	8.0 (0.01)	25.25 (0.001)	9.93 (0.007)	17.95 (0.001)	8.08 (0.02)	19.66 (0.001)	33.47 (0.001)
Area deprivation								
Least deprived	176	122	126	90	150	157	152	15
	22.5 (19.7–25.6)	15.6 (13.2–18.3)	16.8 (14.3–19.7)	11.5 (9.4–13.9)	19.2 (16.6–22.1)	20.1 (17.4–23.0)	19.5 (16.8–22.4)	1.9 (1.2–3.2)
Moderately deprived	377	207	189	191	237	234	281	34
	30.4 (27.9–33.1)	16.7 (14.7–18.9)	15.9 (13.9–18.1)	15.5 (13.6–17.6)	19.2 (17.1–21.5)	18.9 (16.8–21.2)	22.7 (20.5–25.1)	2.7 (2.0–3.8)
Most deprived	284	182	187	170	183	156	211	58
	33.8 (30.6–37.0)	21.7 (19.0–24.6)	23.4 (20.6–26.5)	20.2 (17.6–23.1)	21.9 (19.2–24.8)	18.5 (16.1–21.3)	25.1 (22.3–28.2)	6.9 (5.4–8.9)
Pearson chi^2 (p value)	26.3 (0.001)	12.2 (0.002)	19.6 (0.001)	23.35 (0.001)	2.71 (0.2)	0.68 (0.7)	7.46 (0.02)	34.04 (0.001)
Food security								
Secure	609	369	358	326	412	405	468	54
	26.1 (24.3–27.9)	15.8 (14.4–17.3)	16.0 (14.5–17.5)	14 (12.6–15.4)	17.7 (16.2–19.3)	17.3 (15.8–18.9)	20.0 (18.5–21.7)	2.3 (1.8–3.0)
Insecure	225	141	141	124	155	140	172	53
	43.8 (39.5–48.1)	27.4 (23.7–31.4)	29.2 (25.3–33.4)	24.3 (20.7–28.2)	30.4 (26.5–34.5)	27.2 (23.5–31.2)	33.5 (29.6–37.7)	10.4 (8.0–13.3)
Pearson chi^2 (p value)	63.8 (0.001)	38.7 (0.001)	46.52 (0.001)	33.3 (0.001)	42.23 (0.001)	26.7 (0.001)	43.83 (0.001)	75.14 (0.001)

each type of violence (See Table 1 for definition of each type of violence). All violence variables were dichotomous. Additionally, we created two binary variables, "Any IPV" and "Any non-partner violence", which captured whether a respondent had experienced any of the five types of IPV and any of the two types of non-partner violence respectively.

2.7.3. Sociodemographic exposures

Sociodemographic variables were used to explore prevalence rates of reported ACEs among sub-group populations and as potential confounders in multivariate analyses. These variables included age, gender, ethnicity (European, Māori, Pacific, Asian, MELAA [Middle East or Latin American or African]), personal income, educational attainment (primary or secondary education, any tertiary education), employment status, area level deprivation, and food security status (secure, insecure). Age was grouped into six cohorts: 16−24, 25−34, 35−44, 45−54, 55−64, and 65 and over. Personal income was grouped into four categories: $0-$49 K, $50-$74 K, $75-$100 K, & > $100 K. Definitions for employment status, area level deprivation (Exeter, Zhao, Crengle, Lee, & Browne, 2017), and food security are presented in Table 1.

2.8. Data analysis

Descriptive statistics for the overall sample, stratified by sex, were estimated across several key sociodemographic variables, including age group, ethnicity, personal income, educational attainment, employment status, area deprivation level, and food security status (Table 2).

Prevalence and 95 %CIs for each of the eight ACE types was calculated, stratified by each of the aforementioned sociodemographic characteristics. ACE scores and the binary variable "Any ACE" and 95 %CIs were also estimated for each of the sociodemographic groups.

Prevalence and 95 % CIs for each of the five types of IPV and two types of non-partner violence were calculated stratified by gender. Prevalence of "Any IPV" and "Any non-partner violence" with 95 %CIs were also estimated.

Finally, multivariate logistic regression models were developed to assess association between ACEs (individual ACEs, ACE score, and Any ACE) and the five types of IPV and two non-partner violence variables. Odds ratios were adjusted for factors that could have affected both ACE and violence experiences, as shown in previous studies (Brown, Thacker, & Cohen, 2013; Ridings et al., 2010; Schüssler-Fiorenza Rose, Xie, & Stineman, 2014) and based on analyses shown in Table 3. Specifically, we controlled for the following sociodemographic characteristics as confounders: gender, age group, ethnicity, and area deprivation level. Our first eight set of regression models included individual ACE categories as independent variables to explore the individual contribution of each category to lifetime victimisation of five types of IPV and two types of non-partner violence. Our final set of regression models used the ACE score as the independent variable to identify the cumulative effect of exposure to multiple ACEs on violence victimisation during adulthood. Missing data including: Do not know, do not remember, and no responses were excluded from analyses. Data analyses were conducted using STATA software version 15.1 (StataCorp, 2017).

3. Results

3.1. Prevalence of adverse childhood experiences

Table 3 demonstrates the prevalence estimates of each ACE for the whole sample, stratified by sociodemographic characteristics. Of individual ACE types, emotional abuse was the most commonly reported (29.2 %; 95 % CI, 27.6 %–30.9 %), followed by parental separation or divorce (22.5 %; 95 % CI, 21 %–24.1 %) and household substance abuse (20 %; 95 % CI, 18.5 %–21.5 %). The least prevalent exposure category was having an incarcerated household member (3.7 %; 95 % CI, 3.1 %–4.5 %). ACEs were widespread across different sociodemographic groups. Female respondents reported a greater prevalence of all types of ACEs. There was a significantly higher proportion of females who reported witnessing IPV, household substance abuse, household mental illness and sexual abuse as a child ($p = 0.001$). Gender differences were particularly pronounced for sexual abuse with 26 % (95 %CI; 23.8 %–28.4 %) of female respondents reporting this type of abuse compared with 10.6 % (95 %CI; 9.1 %–12.4 %) of male respondents.

Regarding ACEs across age-cohorts, overall, lower rates of all types of ACEs were reported by older respondents. The only exception was sexual abuse where the older groups (45 years and older) reported higher values (approximately 20 %) compared with the younger groups (16–44 years old). Those who identified as Māori reported the greatest prevalence of almost all ACE types, followed by Pacific people. Those who identified as Asian reported the lowest prevalence of all ACE types. ACEs were also more prevalent among those who were unemployed, living in the most deprived areas and who were food insecure.

Regarding ACE score, our findings indicated that exposure to multiple ACEs were widespread, with more than half of survey respondents reporting having experienced at least one ACE (55 %, 95 % CI 53.2 %–56.8 %) and 11.6 % (95 % CI 10.4 %–12.8 %) reporting having experienced four or more ACEs. The percentage of those who experienced any or multiple ACEs varied across sociodemographic subgroups and showed similar patterns to individual ACEs. Overall, those who were: younger, identified as Māori, unemployed, lived in the most deprived areas, and those who were food insecure reported significantly higher exposure to ACEs ($p < 0.001$) (Table 4).

3.2. Prevalence estimates of violence exposure as an adult

Table 5 shows prevalence estimates of reported IPV and non-partner violence experienced after the age of 15 in the sample,

Table 4
Number of ACEs experienced by sociodemographic characteristics, the 2019 New Zealand Family Violence Survey.

Characteristics	0 ACE n % (95% CI)	1 ACE n % (95% CI)	2 ACEs n % (95% CI)	3 ACEs n % (95% CI)	4 or more ACEs n % (95% CI)	Any ACEs (one or more) n % (95% CI)
Total	1300 45.0 (43.2–46.8)	628 21.7 (20.3–23.3)	380 13.2 (12.0–14.4)	246 8.5 (7.5–9.6)	334 11.6 (10.4–12.8)	1588 55 (53.2–56.8)
Gender *						
Female	634 43.3 (40.1–45.9)	298 20.4 (18.4–22.5)	198 13.5 (11.9–15.4)	126 8.6 (7.3–10.1)	208 14.2 (12.5–16.1)	830 56.7 (54.1–59.2)
Male	666 46.8 (44.2–49.4)	330 23.2 (21.1–25.4)	182 12.8 (11.1–14.6)	120 8.4 (7.1–10.0)	125 8.8 (7.4–10.4)	757 53.2 (50.6–55.8)
Age group, y*						
16–24	72 31.6 (25.9–37.9)	53 23.2 (18.2–29.2)	40 17.5 (13.1–23.0)	25 11.0 (7.5–15.7)	38 16.7 (12.4–22.1)	156 68.4 (62.1–74.1)
25–34	137 38.6 (33.7–43.8)	66 18.6 (14.9–23.0)	63 17.7 (14.1–22.1)	36 10.1 (7.4–13.7)	53 14.9 (11.6–19.0)	218 61.4 (56.2–66.3)
35–44	221 43.6 (39.3–47.9)	114 22.5 (19.0–26.3)	52 10.3 (7.9–13.2)	49 9.7 (7.4–12.6)	71 14.0 (11.2–17.3)	286 56.4 (52.0–60.7)
45–54	230 42.0 (37.9–46.1)	122 22.3 (19.0–25.9)	76 13.9 (11.2–17.0)	42 7.7 (5.7–10.2)	78 14.2 (11.5–17.4)	318 58.0 (53.8–62.1)
55–64	214 42.1 (37.9–46.5)	121 23.8 (20.3–27.7)	69 13.6 (10.9–16.8)	48 9.4 (7.2–12.3)	56 11.0 (8.6–14.1)	294 57.9 (53.5–62.1)
≥ 65	424 57.4 (53.8–61.0)	152 20.6 (17.8–23.7)	80 10.8 (8.8–13.3)	45 6.1 (4.6–8.1)	37 5.0 (3.6–6.8)	314 42.5 (39.0–46.1)
Ethnicity *						
European	916 46.2 (44.0–48.4)	443 22.3 (20.5–24.2)	263 13.3 (11.8–14.8)	162 8.2 (7.0–9.4)	200 10.1 (8.8–11.5)	1068 53.8 (51.6–56.0)
Māori	70 22.0 (17.8–26.9)	66 20.7 (16.6–25.6)	51 16.0 (12.4–20.5)	44 13.8 (10.4–18.1)	87 27.4 (22.7–32.5)	248 78 (73.1–82.2)
Pacific	73 45.9 (38.3–53.7)	28 17.6 (12.4–24.3)	16 10.1 (6.2–15.8)	18 11.3 (7.2–17.3)	24 15.1 (10.3–21.6)	86 54.1 (46.3–61.7)
Asian	214 56.6 (51.5–61.5)	88 23.3 (19.3–27.8)	44 11.6 (8.8–15.3)	18 4.8 (3.0–7.4)	14 3.7 (2.2–6.2)	164 43.4 (38.5–48.4)
MELAA	25 55.6 (40.8–69.4)	3 6.7 (2.1–18.9)	5 11.1 (4.6–24.2)	3 6.7 (2.1–18.9)	9 20.0 (10.7–34.3)	20 44.4 (30.6–59.2)
Personal income, $**						
0-$49K	645 42.9 (40.4–45.4)	326 21.7 (19.7–23.8)	189 12.6 (11.0–14.3)	137 9.11 (7.7–10.7)	207 13.8 (12.1–15.6)	859 57.1 (54.6–59.6)
$50-$74K	222 43.6 (39.3–48.0)	119 23.4 (19.9–27.2)	81 15.9 (13.0–19.3)	42 8.2 (6.1–11.0)	45 8.8 (6.7–11.6)	287 56.4 (52.0–60.6)
$75-$100K	159 47.0 (41.8–52.4)	69 20.4 (16.4–25.0)	47 13.9 (10.6–18.0)	34 10.1 (7.3–13.7)	29 8.6 (6.0–12.1)	179 53 (47.6–58.2)
>$100K	185 48.3 (43.3–53.3)	88 23.0 (19.0–27.5)	47 12.3 (9.3–16.0)	27 7.0 (4.9–10.1)	36 9.4 (6.8–12.8)	198 51.7 (46.7–56.7)
Educational attainment						
Primary or Secondary	540 43.9 (41.1–46.7)	265 21.5 (19.3–23.9)	160 13.0 (11.2–15.0)	112 9.1 (7.6–10.8)	153 12.4 (10.7–14.4)	690 56.1 (53.3–58.8)
Tertiary	757 45.9 (43.5–48.3)	361 21.9 (20.0–23.9)	220 13.3 (11.8–15.1)	133 8.1 (6.8–9.5)	178 10.8 (9.4–12.4)	892 54.1 (51.7–56.5)

(*continued on next page*)

Table 4 (*continued*)

Characteristics	0 ACE n % (95% CI)	1 ACE n % (95% CI)	2 ACEs n % (95% CI)	3 ACEs n % (95% CI)	4 or more ACEs n % (95% CI)	Any ACEs (one or more) n % (95% CI)
Employment status*						
Unemployed	118	70	48	32	63	213
	35.6 (30.7–41.0)	21.1 (17.1–25.9)	14.5 (11.1–18.7)	9.7 (6.9–13.4)	19.0 (15.1–23.6)	64.3 (59.0–69.3)
Student	68	33	24	13	23	93
	42.2 (34.8–50.0)	20.5 (14.9–27.4)	14.9 (10.2–21.3)	8.1 (4.7–13.4)	14.3 (9.7–20.6)	57.8 (50.0–65.2)
Employed /retired	1111	525	308	201	248	1282
	46.4 (44.4–48.4)	21.9 (20.3–23.6)	12.9 (11.6–14.3)	8.4 (7.3–9.6)	10.4 (9.2–11.6)	53.6 (51.6–55.6)
Area deprivation level*						
Least deprived	399	163	95	58	74	390
	50.6 (47.1–54.0)	20.7 (18.0–23.6)	12.0 (9.9–14.5)	7.3 (5.7–9.4)	9.4 (7.5–11.6)	49.4 (45.9–52.9)
Moderately deprived	549	277	176	107	135	695
	44.1 (41.4–46.9)	22.3 (20.0–24.7)	14.1 (12.3–16.2)	8.6 (7.2–10.3)	10.8 (9.2–12.7)	55.9 (53.1–58.6)
Most deprived	350	187	109	81	125	502
	41.1 (37.8–44.4)	21.9 (19.3–24.8)	12.8 (10.7–15.2)	9.5 (7.7–11.7)	14.7 (12.4–17.2)	58.9 (55.6–62.2)
Food security *						
Secure	1127	525	307	181	212	1225
	47.9 (45.9–49.9)	22.3 (20.7–24.0)	13.0 (11.7–14.5)	7.7 (6.7–8.8)	9.0 (7.9–10.2)	52.1 (50.0–54.1)
Insecure	165	100	70	63	122	355
	31.7 (27.9–35.9)	19.2 (16.1–22.8)	13.5 (10.8–16.7)	12.1 (9.6–15.2)	23.5 (20–27.3)	68.3 (64.1–72.1)

* Chi square test for association between ACE score and demographic characteristic was significant at $p = 0.001$.

** Chi square test for association between ACE score and demographic characteristic was significant at $p = 0.01$.

Table 5
Prevalence estimates of reported IPV and non-partner violence stratified by gender, the 2019 New Zealand Family Violence Survey.

Violence type	Survey respondents					
	Female respondents		Male respondents		All	
	n(%)	95 %CI	n(%)	95 %CI	n(%)	95 %CI
IPV type [a]						
Physical	407 (28.7)	26.4–31.1	391 (29.0)	26.7–31.5	798 (28.8)	27.2–30.5
Sexual	191 (13.5)	11.8–15.3	28 (2.1)	14.4–3.0	219 (7.9)	7.0–9.0
Psychological	478 (33.7)	31.2–36.2	267 (19.8)	17.8–22.1	745 (26.9)	25.3–28.6
Controlling behaviour	309 (21.7)	19.7–24.0	262 (19.4)	17.4–21.6	571 (20.6)	19.1–22.2
Economic	210 (16.9)	14.9–19.1	158 (11.9)	10.2–13.7	368 (14.3)	13.0–15.7
Any IPV (one or more type)	646 (45.1)	42.6–47.7	563 (41.5)	38.9–44.2	1209 (43.4)	41.5–45.2
Non-partner violence [b]						
Physical violence	182 (12.6)	11.0–14.4	577 (40.9)	38.3–43.5	760 (26.6)	25.0–28.3
Sexual violence	128 (8.9)	7.5–10.5	30 (2.1)	1.5–3.0	158 (5.5)	4.8–6.4
Any non-partner violence	253 (17.3)	15.4–19.3	582 (40.90)	38.4–43.5	836 (28.9)	27.3–30.6

Gender differences were significant for Sexual IPV, psychological IPV, economic IPV (all $p = 0.001$).
Gender differences were significant for any non-partner violence, physical non-partner violence, sexual non-partner violence (all $p = 0.001$).
[a] Denominator for IPV analyses was limited to ever partnered respondents (1431 female, 1355 male, 2787 all).
[b] Denominator for non-partner violence analyses was the whole sample regardless of their partnership status (1464 female, 1423 male, 2888 all).

stratified by gender. Physical and psychological IPV were the most common with over one quarter of the sample reporting having experienced these types of violence by an intimate partner [28.8 % (95 %CI, 27.2–30.5) for physical IPV; 26.9 % (95 %CI, 25.3–28.6) for psychological IPV]. Female respondents reported more sexual, psychological and economic IPV ($p = 0.001$). Physical violence by a non-partner was reported by 26.6 % (95 %CI, 25.0 %–28.3 %) of the sample, and 5.5 % (95 %CI, 4.8 %–6.4 %) reported sexual violence by a non-partner after age 15. Female respondents reported more non-partner sexual violence, and male respondents reported more physical non-partner violence ($p = 0.001$).

3.3. Relationship between ACEs and violence exposure during adulthood

Among those who reported ACE exposure, psychological and physical violence were the most common types of IPV experienced, followed by controlling behaviours. As the number of ACEs increased, the risk (adjusted odds ratio) of reporting all types of partner and non-partner violence during adulthood increased (Table 6). Compared to those with no ACE exposure, those with exposure to 4 or more ACEs were: 4.3 times more likely to report experience of controlling behaviour from an intimate partner (95 %CI; 3.27–5.76); 5.8 times more likely to report physical IPV (95 %CI; 4.42–7.60); 6.2 times more likely to report physical non-partner violence (95 % CI; 4.61–8.39), and 9.5 times more likely to report exposure to non-partner sexual violence (95 %CI; 5.77–15.72).

4. Discussion

The study is the first to provide prevalence estimates for a full range of ACEs experienced by people before the age of 18 from a large, diverse sample of women and men in New Zealand, and to explore associations between ACEs and later exposure to violence as an adult. It is hoped that provision of this empirical evidence will catalyze actions to recognize and respond to ACEs in future, as has been the case internationally.

Findings show that ACEs in NZ were prevalent and co-occurring, with one out of two respondents reporting having experienced at least one ACE and one out of nine reporting at least four ACEs before the age of 18. These findings are consistent with overall ACEestimates from the US (Giano, Wheeler, & Hubach, 2020), and Canada (McDonald, Kingston, Bayrampour, & Tough, 2014). Other studies have also noted the high prevalence of emotional abuse (Giano et al., 2020; Houtepen et al., 2020; McDonald et al., 2014). The co-occurrence and interrelationship of ACEs has also been well documented elsewhere(Dong et al., 2004), which has clear implications for the importance of comprehensive assessment of multiple forms of adversity and trauma in the context of service provision.

ACEs were widespread across all sociodemographic characteristics, yet some groups experienced a greater burden of such exposures. Consistent with US population-based studies (Logan-Greene, Green, Nurius, & Longhi, 2014; Merrick et al., 2018), in our study all ACEs except child sexual abuse were more prevalent among younger respondents, suggesting that these experiences may be becoming more common for more recent generations.

The high prevalence rates of all ACEs among those who identified as Māori requires urgent attention. Of particular concern was the high prevalence of those who reported having a household member who was incarcerated, reported by 17.4 % of Māori respondents, the highest percentage in the cohort. There are acknowledged racial biases in prosecution and incarceration rates for Māori, built on discriminatory policing practices in Aotearoa New Zealand (Workman, 2019). The gross disproportionality of Māori incarceration and its adverse inter-generational impact is well documented (Deckert, 2020; McIntosh & Workman, 2017; Stanley & Mihaere, 2018; George et al., 2014) . One out of two who identified as Māori reported experiencing emotional abuse, and more than one third reported almost all other ACEs. Cumulative ACEs were also extremely commonly reported by Māori respondents, with 78 % reporting at least

Table 6
Association between each individual ACE, ACE score and reported experience of different types of lifetime intimate partner and non-partner violence, the 2019 New Zealand Family Violence Survey.

	Lifetime physical IPV		Lifetime sexual IPV		Lifetime psychological IPV		Lifetime controlling behaviour		Lifetime economic IPV		Any IPV (one or more type)	
Individual ACE[b]	n (%)	AOR (95 %CI)[a]	n (%)	AOR (95 %CI)[a]	n (%)	AOR (95 %CI)[a]	n (%)	AOR (95 %CI)[a]	n (%)	AOR (95 %CI)[a]	n (%)	AOR (95 %CI)[a]
Abuse												
Emotional	366 (45.5)	2.8 (2.36–3.37)	102 (12.7)	2.20 (1.63–2.96)	344 (42.7)	2.85 (2.37–3.43)	268 (33.3)	2.51 (2.06–3.06)	160 (21.7)	2.20 (1.74–2.78)	505 (62.7)	2.85 (2.40–3.39)
Physical	251 (50.6)	3.20 (2.61–3.92)	75 (15.1)	2.56 (1.87–3.51)	219 (44.1)	2.63 (2.13–3.24)	177 (35.7)	2.61 (2.10–3.25)	111 (25.2)	2.38 (1.84–3.08)	332 (66.8)	3.19 (2.60–3.93)
Sexual	214 (44.0)	2.51 (2.03–3.11)	95 (19.6)	3.57 (2.61–4.88)	221 (45.5)	2.59 (2.09–3.21)	165 (34.0)	2.57 (2.04–3.24)	111 (26.1)	2.42 (1.86–3.16)	305 (62.6)	2.69 (2.18–3.32)
Household dysfunction												
IPV witnessing	206 (46.8)	2.54 (2.05–3.14)	59 (19.6)	1.80 (1.28–2.51)	188 (42.7)	2.27 (1.82–2.82)	156 (35.4)	2.38 (1.90–2.99)	99 (24.5)	2.17 (1.67–2.83)	277 (62.8)	2.47 (1.99–3.06)
Household substance abuse	240 (43.6)	2.22 (1.82–2.70)	85 (15.4)	2.58 (1.90–3.50)	231 (41.9)	2.23 (1.83–2.73)	179 (32.5)	2.13 (1.72–2.64)	119 (23.3)	2.21 (1.72–2.84)	335 (60.6)	2.27 (1.87–2.75)
Household mental illness	219 (41.3)	1.98 (1.62–2.43)	78 (14.7)	2.12 (1.55–2.91)	232 (43.8)	2.34 (1.91–2.88)	156 (29.4)	1.73 (1.38–2.15)	107 (22.1)	2.02 (1.55–2.62)	315 (59.2)	2.09 (1.71–2.54)
Parental separation/ divorce	251 (40.4)	1.88 (1.55–2.29)	77 (12.4)	1.87 (1.36–2.57)	242 (39)	1.96 (1.60–2.39)	174 (28.0)	1.53 (1.23–1.90)	101 (17.5)	1.41 (1.08–1.84)	350 (56.3)	1.79 (1.48–2.16)
Incarcerated household member	63 (64.3)	4.34 (2.82–6.66)	21 (21.4)	3.09 (1.78–5.35)	52 (53.1)	2.96 (1.94–4.51)	43 (43.9)	2.52 (1.66–3.84)	34 (37.4)	3.68 (2.33–5.80)	71 (72.4)	3.13 (1.98–4.95)
ACEs score												
0 (reference)	227 (18.3)	–	57 (4.7)	–	206 (16.6)	–	166 (13.4)	–	103 (8.9)	–	374 (29.8)	
1	153 (25.4)	1.48 (1.17–1.87)	38 (6.3)	1.41 (0.91–2.18)	145 (24.1)	1.59 (1.24–2.02)	109 (18.1)	1.39 (1.06–1.81)	78 (13.9)	1.69 (1.23–2.32)	257 (42.5)	1.70 (1.39–2.08)
2	131 (35.8)	2.44 (1.88–3.17)	37 (10.1)	2.21 (1.4–3.47)	123 (33.6)	2.46 (1.88–3.22)	86 (23.5)	1.87 (1.39–2.51)	58 (17.1)	2.20 (1.55–3.13)	197 (53.5)	2.62 (2.06–3.33)
3	103 (43.3)	3.29 (2.43–4.43)	22 (9.2)	1.91 (1.12–3.29)	97 (40.8)	3.36 (2.47–4.57)	71 (29.8)	2.57 (1.85–3.57)	42 (19.0)	2.53 (1.70–3.77)	148 (61.9)	3.65 (2.73–4.89)
4+	184 (57.0)	5.80 (4.42–7.60)	65 (20.1)	4.38 (2.92–6.55)	174 (53.9)	5.37 (4.08–7.07)	139 (43.0)	4.34 (3.27–5.76)	87 (30.0)	4.48 (3.20–6.27)	233 (72.1)	5.73 (4.34–7.56)
Any ACE[c] (One or more)	571 (37.4)	2.53 (2.12–3.04)	162 (10.6)	2.27 (1.64–3.14)	539 (35.2)	2.60 (2.16–3.15)	405 (26.5)	2.15 (1.76–2.64)	265 (18.8)	2.40 (1.87–3.07)	835 (54.4)	2.66 (2.27–3.13)

Individual ACE[b]	Lifetime non-partner physical abuse		Lifetime non-partner sexual abuse		Any non-partner violence	
	n (%)	AOR (95 %CI)[a]	n (%)	AOR (95 %CI)a	n (%)	AOR (95 %CI)a
Abuse						
Emotional	335 (40.2)	2.84 (2.34–3.45)	96 (11.5)	2.84 (2.34–3.45)	375 (44.8)	3.0 (2.49–3.61)
Physical	250 (49.1)	4.59 (3.66–5.76)	69 (13.6)	4.59 (3.66–5.76)	273 (53.4)	4.40 (3.55–5.45)
Sexual	151 (30.2)	2.20 (1.72–2.81)	97 (19.5)	2.20 (1.72–2.81)	196 (39.0)	2.85 (2.26–3.59)
Household dysfunction						
IPV witnessing	176 (39.3)	2.59 (2.05–3.28)	60 (13.4)	2.59 (2.05–3.28)	201 (44.6)	2.72 (2.18–3.40)
Household substance abuse	207 (36.4)	2.15 (1.73–2.67)	64 (11.3)	2.15 (1.73–2.67)	232 (40.7)	2.20 (1.79–2.70)
Household mental illness	180 (33.1)	1.98 (1.58–2.48)	72 (13.3)	1.98 (1.58–2.48)	210 (38.4)	2.12 (1.71–2.63)
Parental separation/divorce	207 (32.2)	1.44 (1.16–1.78)	57 (8.8)	1.44 (1.16–1.78)	234 (36.3)	1.54 (1.26–1.88)
Incarcerated household member	48.6 (52)	3.17 (2.06–4.87)	13 (12.3)	3.17 (2.06–4.87)	54 (50.5)	2.79 (1.84–4.23)
ACEs score						
0 (reference)	230 (18.1)	–	26 (2.0)	–	246 (18.9)	–
1	160 (25.6)	1.57 (1.23–2.01)	27 (4.3)	2.28 (1.31–3.96)	178 (28.3)	1.70 (1.35–2.14)
2	127 (33.6)	2.67 (2.02–3.54)	22 (5.8)	3.02 (1.67–5.43)	137 (36.0)	2.70 (2.07–3.53)
3	87 (35.5)	2.90 (2.09–4.03)	27 (11.0)	6.29 (3.55–11.14)	98 (39.8)	3.17 (2.32–4.33)
4+	156 (46.8)	6.22 (4.61–8.39)	56 (16.9)	9.52 (5.77–15.72)	177 (53.0)	6.71 (5.04–8.92)
Any ACE[c] (One or more	530 (33.5)	2.55 (2.11–3.09)	132 (8.3)	4.39 (2.84–6.78)	590 (37.15)	2.73 (2.27–3.28)

[a] Adjusted for age, gender, ethnicity, and area deprivation level.
[b] Reference group for each individual ACE was those who reported that they did not experience that individual ACE.
[c] Reference group was those with zero ACE.

one ACE, and 27.4 % reported experiencing four or more ACEs. These findings demand urgent action to develop, resource and implement culturally informed intervention and prevention strategies (Dhunna, Lawton, & Cram, 2018; Ketu-McKenzie, 2019; Pihama et al., 2017). Addressing these impacts will require cognizance of the intergenerational impacts of adversity, including redress for experiences of colonization, and historical and cumulative trauma (Pihama et al., 2017).

Those who were in low socioeconomic groups bore a disproportionately higher burden of ACEs. The socioeconomic indicators included in this study (employment status, personal income, area deprivation level, and food security), measured the respondents' socioeconomic circumstances at the time of interview, i.e. during adulthood. As such, these findings may not reflect the life situation that the respondent lived in while they were growing up, but instead are outcomes of adversity experienced during childhood. The findings highlight the importance of early intervention for childhood adversity, as experiences in childhood may exacerbate social and economic inequities across the lifespan and into future generations (Braveman & Barclay, 2009; CSDH, 2008) .

4.1. ACEs and violence exposure in adulthood

Lifetime exposure to violence by partners and non-partners in adulthood was common. We found that all 8 individual ACEs were significantly associated with every type of IPV and non-partner violence exposure after adjusting for potential confounders. The increase in the cumulative number of ACEs was also associated with increased odds of IPV and non-partner violence exposure. These findings are consistent with previous studies (Guedes & Mikton, 2013). Witnessing or experiencing violent events as a child has been hypothesized to lead to the intergenerational transfer of violence through imitating or tolerating similar behaviors in adult relationships (Bensley, Van Eenwyk, & Wynkoop Simmons, 2003; Fergusson et al., 2008; McKinney, Caetano, Ramisetty-Mikler, & Nelson, 2009), or through pathways such as fostering lowered self-opinion in relation to others and maladaptive beliefs about relationships (Reyome, 2010).

4.2. Limitations

The prevalence rates of both ACEs and violence exposure in adulthood may be underestimated. Those who experienced the most severe ACEs and adult violence exposures may have been less likely to participate. Additionally, as rest homes and institutions were excluded from the sample, those who experienced more severe IPV and ACEs could have been missed. This may have particularly contributed to the lower prevalence rates reported by the older age groups. Finally, the cross-sectional nature of this study limits the ability to draw causal inferences from analyses.

4.3. Implications

Our findings highlight the need to address the high rates of ACEs in New Zealand. Multiple strategies will be needed to achieve both prevention and response, including funding and implementing public health interventions that promote the ability of all adults to provide safe, stable and nurturing environments for children. Additionally, programmes designed to provide support for adult survivors of IPV and non-partner violence should be equipped to address and provide therapeutic responses to childhood adverse experiences. Further, this study again draws attention to the urgent need to develop, resource and implement culturally informed intervention and prevention strategies.

5. Conclusion

The findings provide the first comprehensive assessment of the prevalence of ACEs in the New Zealand population, and document the association of these experiences with violence exposure in later life. The findings indicate that prevention of childhood trauma, maltreatment, and family dysfunction remain important public health goals that need to be addressed to support the wellbeing of both children and adults.

Funding

This study received funding from the New Zealand Ministry of Business, Innovation and Employment, Contract number CONT-42799-HASTR-UOA.

Declaration of Competing Interest

The authors report no declarations of interest.

Acknowledgments

We gratefully acknowledge participants, the interviewers, and the study project team, led by Patricia Meagher-Lundberg. We also acknowledge the representatives from the Ministry of Justice, the Accident Compensation Corporation, the New Zealand Police, and the Ministry of Education, who were part of the Governance Group for Family and Sexual Violence at the inception of the study.

This study is based on the WHO Violence Against Women Instrument as developed for use in the WHO Multi-Country Study on

Women's Health and Domestic Violence and has been adapted from the version used in Asia and the Pacific by kNOwVAWdata Version 12.03. It adheres to the WHO ethical guidelines for the conduct of violence against women research.

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