The effect of childhood adversity on mental health in young adults: a longitudinal study

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Abstract

Childhood adversity has been consistently linked to negative outcomes in children's mental health. Nonetheless, little is known about the lifelong effects of these experiences during a stage of development with high rates of both internalising and externalising problems: emerging adulthood. Therefore, the present study analyses the relation between self-reported exposure to a wide range of adversities in a community sample of young adults and externalising (deviant behaviour) and internalising (stress, anxiety and depression) outcomes. In this two-time prospective study, 490 young adults (62.4% females) with ages ranging from 18 to 20 years (M = 18.90) were interviewed in person first and then over an online questionnaire one year later (N = 84). Linear regressions were performed for each mental health outcome controlling for demographic variables. Physical abuse emerged as the best predictor of deviant behaviour in both time periods in a univocal relation, whereas internalising outcomes seemed to have a broader multifactorial association with distinct types of adversities only in Time 1. These findings, along with the results of the stability externalising consequences derived from physical abuse, emphasise the importance of prevention and intervention strategies to diminish the transmission of these maladaptive strategies in later periods of life.

Keywords Adverse childhood experiences (ACEs) · Deviant behaviour · Internalising outcomes · Longitudinal study

Introduction

Adverse Childhood Experiences (ACEs) have been defined as stressful or traumatic experiences in childhood or adolescence, including different types of maltreatment: commission (e.g., physical abuse, sexual abuse), omission (emotional and physical neglect), and household dysfunctions (e.g., incarcerated family member, domestic violence), (Felitti et al., 1998). Unfortunately, these kinds of experiences are quite prevalent across childhood and adolescence: between 12% and 70% of children aged 0–6 years old have been exposed to three or more negative experiences (Liming & Grube, 2018). Over 40% of youth in the US have one or more adverse experiences (Barnes et al., 2020), and nearly 50% of Spanish adolescents have one or more adverse experiences (almost 20%, 4 or more), (Pereda et al., 2014). In other age groups, similarly high percentages of adults reported facing at least one of these experiences are also found (67%), (Dong et al., 2004). In addition, exposure to multiple types of adversities is also very common, showing how closely connected these experiences are (Finkelhor et al., 2011).

Multiple studies have found strong associations between these experiences and a vast array of negative behaviours and health outcomes later in development, with considerable associated emotional and financial costs (Bellis et al., 2014; Loxton et al., 2019). For instance, these experiences are linked with problems associated with psychological wellbeing (Nurius et al., 2015), mental health and somatic disturbances, obesity, sexual dissatisfaction (Anda et al., 2006), offending and deviant behaviour (Basto-Pereira et al., 2016; Gomis-Pomares & Villanueva, 2020), autoimmune diseases (Dube et al., 2009), and even premature death (Brown et al., 2009).

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The underlying mechanism for this link between ACEs and these negative outcomes is explained by Felitti et al.'s model (1998). Extremely relevant developmental processes are disrupted by adversity at different levels (social, emotional and cognitive impairments). Consequently, the individual activates, in a conscious or unconscious way, risky health strategies (such as substance abuse and deviant behaviours) to cope with the stress and anxiety produced by these adverse experiences. In the short term, these strategies may be valid due to their immediate pharmacological and psychological benefits (Dube et al., 2003a). However, in the long term, these coping devices are maladjusted and might lead to additional negative health problems. If they are not stopped, the negative impact of these childhood experiences appears to be a consistent phenomenon over time which can lead to the transmission of these negative impacts for up to 4 successive generations (Dube et al., 2003b).

In addition to this enormous emotional cost, which already justifies research in this field, the economic cost is also a pressing issue for society. Bellis et al. (2014) found that a 10% reduction in the prevalence of adverse childhood experiences could equate to annual savings of $105 billion in Europe and North America. Ensuring safe and nurturing childhoods would be economically beneficial and would relieve pressure on all the involved systems, such as child protection services, mental health services and health care systems. The considerable associated emotional and financial costs of suffering the negative impact of adverse experiences in childhood make this relation an urgent need to address.

The most widely adopted methodology to operationalise the study of ACEs has been a cumulative approach, that is, the total number of ACEs that individuals face through childhood and adolescence. In this sense, a cumulative score of four or more ACEs seems to be a significant threshold associated with multiple and serious negative outcomes (Campbell et al., 2016; Hughes et al., 2017). Nevertheless, some authors found that the cumulative effect of ACEs per se was not a very informative index (Craig et al., 2022; Lacey et al., 2022) and was unable to yield a significant relationship with negative outcomes (McLaughlin & Sheridan, 2016; Raffaelli et al., 2018).

In addition, this cumulative approach implies that the wide range of adverse experiences contributes similarly to the risk of negative outcomes, which is certainly not the case. Specific ACEs seem to be significantly related to different types of outcomes, which may be seen as different strategies to cope with these harsh experiences (Gomis-Pomares & Villanueva, 2020). For example, there is a classical association in children and adolescents between physical abuse and externalising problems, and neglect and internalising problems. Relative to physically abused children, neglected

children have more social withdrawal and limited peer interactions and internalising (as opposed to externalising problems), (Hildyard & Wolfe, 2002).

Similarly, some authors have also suggested a conceptual framework, differentiating between deprivation (absence of expected environmental inputs and complexity, e.g., neglect) and threat (presence of experiences that represent a threat to one's physical integrity, e.g., physical abuse), predicting distinct effects on neural development (McLaughlin et al., 2014; McLaughlin & Sheridan, 2016). While children exposed to deprivation would exhibit internalising problems, children exposed to fear threat would mostly show externalising problems. Therefore, it is of paramount importance to include this differential analysis to disentangle the influence of early experiences on later development outcomes to guide prevention and intervention programs.

This classical link between types of ACEs and distinct externalising and internalising outcomes in childhood and adolescence is not extensively explored in later age periods, such as emerging adulthood. Emerging adulthood, considered as a new conception of development for the period spanning from 18 to 25 years, has strongly appeared as a key transition period between adolescence and adulthood (Arnett, 2000), presenting relevant nuances that are worth analysing. First, there is a high prevalence of internalising problems in this age period but lower treatment rates than in other later developmental periods such as adulthood from the age of 30 onwards (Adams et al., 2014). Moreover, the highest proportion of individuals with onset of any mental disorders worldwide was before the ages of 18 (48%) and 25 (62%), (Kessler et al., 2012; Solmi et al., 2022). Second, this age period is particularly significant for externalising outcomes, since criminal behaviour peaks at the end of adolescence and the beginning of adulthood (Farrington, 1986; Informe del Instituto Nacional de Estadística [INE], 2022). Thirdly, although generally no bias has been found in retrospective studies of ACEs (Hardt et al., 2010; Hardt & Rutter, 2004), this age range presents even better conditions for cross-time reliability in ACE reporting. Therefore, preventing these negative outcomes from emerging before this age period would be extremely relevant.

Furthermore, in emerging adulthood, few studies have adopted a differential analysis of the impact of specific ACEs on later developments (versus the cumulative approach). Some of these studies found several specific ACEs to be related to externalising problems (Degli Esposti et al., 2020), while other studies obtained more restrictive results, finding just one ACE related to externalising outcomes, namely, physical abuse in community young adults (Gomis-Pomares & Villanueva, 2020; Smith et al., 2005) or sexual abuse in young adults with a history of juvenile delinquency (Basto-Pereira et al., 2016).

One of the first ground-breaking studies describing the "cycle of violence" (Widom, 1989) found that exposure to physical abuse or neglect increased the odds of a future arrest as an adult by 38%. Other authors found that sexual abuse and physical abuse were significant predictors of antisocial behaviour in young adults (Schilling et al., 2007), while others showed that emotional abuse, physical abuse, sexual abuse and neglect were significantly associated with antisocial behaviour at 23 years old (Degli Esposti et al., 2020). All these results seem to show, in any case, a persistent and stable association between specific ACEs and externalising outcomes.

However, the link between specific ACEs and internalising outcomes in young adulthood has been consistently given less attention than that with externalising results. However, again, high heterogeneity in the study results exists. For example, some authors, with community samples, found that several ACEs (sexual abuse, physical abuse and neglect) were significantly associated with depressive symptoms and anxiety disorders (Gardner et al., 2019; Schilling et al., 2007). Meanwhile, other authors found only two types of ACEs (emotional abuse and neglect) strongly associated with depressive symptoms (Humphreys et al., 2020; Infurna et al., 2016), and other studies identified emotional neglect (Grummitt et al., 2022) and emotional abuse (Myers et al., 2021) as the only types of maltreatment independently associated with depressive problems.

As observed, the differential approach of the ACEs' impact deserves further studies to shed light on this highly heterogeneous scenario for externalising and internalising outcomes as well as the stability of negative consequences over the course of a lifetime (Schilling et al., 2007). To also obtain a clearer overall picture of the situation, another variable in these studies should be taken into account: cultural context. Unfortunately, ACEs are present across diverse contexts and cultures (Kaminer et al., 2022). A recent study conducted by Basto-Pereira et al. (2022) found that among young adults living in 10 countries on 5 different continents, there was a high prevalence of ACEs, especially for dysfunctional households (family members with mental illness, substance abuse or separated), with percentages ranging from 26 to 31%, and for physical abuse and physical neglect, both with 18%. Despite this, there is limited research studying the impact of ACEs in non-English speaking populations compared to English-speaking countries.

Moreover, the definitions of maltreatment and its perceived severity may even vary by different cultural groups (Forster et al., 2018; Rose & Meezan, 1996). In this sense, the value of the family in collectivistic societies (such as Spain in this study) is one of the more characteristic points (Hofstede, 1980), and it is not very well-known what the role of the family would be: buffering the impact of these experiences, or on the contrary, exacerbating the vulnerability of its members (Allem et al., 2015). This could affect ACEs related to household dysfunctions, and for this reason, research in non-Western and non-English speaking samples is needed to expand our knowledge of the effect of ACEs (Malvaso et al., 2021), and to enrich prevention programs.

Therefore, the aim of this study was to analyse the long-term impact of specific ACEs on deviant behaviour and internalising outcomes (depression, anxiety and stress) across a longitudinal study in a Spanish community of young adults. The following hypotheses are posited: First, we expect that experiencing physical abuse will be the best predictor of deviant behaviour, while neglect will be most strongly associated with internalising outcomes. Second, these expected relationships will remain consistent across the one-year follow-up period.

Method

Participants

The data for these analyses comes from the first two times of a prospective study of adverse childhood experiences, which is part of the *International Study of Pro/antisocial Behavior in Young Adults* (*SOCIALDEVIANCE1820 Research Project*), (see Basto-Pereira et al., 2020). At Time 1, a total of 490 participants (37.6% males and 62.4% females) with ages ranging from 18 to 20 years (M = 18.90; SD = 0.77) answered self-report questionnaires. Of the total participants, 92.7% were of Spanish origin, and only 7.3% belonged to ethnic minorities. Concerning socioeconomic status (SES), 31.1% presented a low SES, 52.1% had a medium SES and 16.8% had a high SES. To assess SES, parental profession and school education were taken into consideration when the youth was not economically independent. In contrast, for economically independent participants, their level of education and profession were taken into account. According to these two variables (profession and level of education), three levels of SES were coded (high, medium and low) and inter-rater reliability (kappa coefficient) was calculated. The agreement was considered high, reaching an average value of 0.85. In relation to educational level, the majority of the sample had completed at least some university (53%), with the remainder completing either secondary education (42.7%) or primary school (4.3%).

The same participants were asked to complete the questionnaires again one year later (Time 2), (range time = 12–14 months) to assess the existence of temporal stability in the prediction of the variables evaluated. This second time, a sample of 84 participants was obtained (25% males and

75% females), with ages ranging from 19 to 21 years old (M = 19.86; SD = 0.76). The vast majority of the sample was also of Spanish origin (94.2%) versus 5.8% who belonged to ethnic minorities. With regard to socioeconomic status, 25.9% of the participants belonged to a low SES, 66.7% belonged to a medium SES and 7.4% belonged to a high SES. Regarding educational level, as in Time 1, the majority of the sample had completed at least some university (75%), with the remainder completing either secondary education (22.6%) or primary school (2.4%). The attrition rate from Time 1 to Time 2 was 82.8% although attrition analyses indicated that data were missing completely at random.

Procedure

Data for both samples at Time 1 and Time 2 were obtained from different contexts, such as universities, professional schools, adult education centres, and leisure centres, by using convenience and snowball sampling methods. Informed consent was obtained from the University Ethics Committee (reference number 22/2018) and from the participants. All participants took part voluntarily and were entitled to enter a drawing for vouchers. They were informed that the questionnaires were anonymous and that the data were strictly confidential.

At Time 1 (October 2019), all questionnaires were self-reported and administered on a face-to-face basis, averaging 25 min in length. They were completed on paper and pencil in the presence of the researchers who, beforehand, explained the purpose of the study. At Time 2 (October 2020), questionnaires were answered by the participants in a shorter online version that did not include questions about adverse experiences (which were recorded in Time 1), but about the possible consequences associated with them (deviant behaviour and internalising problems). The average response time in this second phase was 15 min. In both administration of the questionnaires (face-to-face questionnaire for Time 1 and the online questionnaire for Time 2) participants filled in a code consisting of the initial of their first name and their two surnames, followed by the day and month of their birthday. This allowed us to link Time 1 codes to Time 2 codes while maintaining anonymity at all times.

In the case of the prediction of deviant behaviour at Time 1, a previously published cross-sectional study from the authors is used for comparison purposes (Gomis-Pomares & Villanueva, 2020).

Measures

Adverse Childhood Experiences (ACEs) Questionnaire (Felitti et al., 1998). This questionnaire was translated by means of a translation and back translation process from English to Spanish. Two experts in the construct measured and culturally involved (co-authors in this study) conducted this process of translation. Items were analysed by two independent judges in order to calculate inter-rater reliability (kappa coefficient). These results are still not published. This questionnaire assesses adverse childhood and adolescent experiences that took place during the first 18 years of life. It is composed of ten different kinds of negative events in the following categories: emotional, physical and sexual abuse, emotional and physical neglect, and household dysfunctions, namely, witnessing domestic violence, parental divorce, household substance abuse, mental illness in the household and incarcerated relatives. According to the original author's instructions (Felitti et al., 1998), child abuse, neglect and exposure to domestic violence were evaluated using a five-point Likert scale of violence (1 = Never true to 5 = Very often true). On the other hand, questions regarding the remaining experiences were evaluated using a dichotomous ("Yes = 1″ or "No = 0″) response style. The ACE questionnaire was scored, and each of the above experiences was classified as "present" or "absent". The total ACE score was calculated by summing all the present ACEs. Some studies have previously analysed and found good psychometric properties of the questionnaire (Holden et al., 2020; Murphy et al., 2014).

The *Deviant Behavior Variety Scale* (DBVS; Sanches et al., 2016) is a 19-item self-response scale on the commission or non-commission of deviant behaviours during the previous year (12-month DBV). It includes both illegal acts such as "*stolen something worth more than 50 euros*" and rule-breaking acts that are not illegal such as "*skipping classes to stay with colleagues, or to go for a ride*". Answers are coded dichotomously (yes/no), and a total score for deviant behaviours is obtained by the sum of affirmative answers. The Portuguese version of this scale showed appropriate psychometric characteristics (α = 0.82), (see Sanches et al., 2016), as did the Spanish version (α = 0.79), (Gomis-Pomares et al., 2022).

The *Depression Anxiety and Stress Scale* (DASS-21) (Daza et al., 2002) is a 21-item self-report questionnaire that measures three negative emotional states: stress, depression and anxiety. Each category contains seven items based on a four-point Likert scale (from 0 = did not apply to me at all to 3 = applied to me very much, or most of the time). Respondents indicated which of the items were true for them during the previous week (e.g., "*I found it difficult to relax*", "*I was aware of dryness in my mouth*" or "*I could not seem to experience any positive feeling at all*"). The higher the score, the more severe the emotional distress was. The questionnaire has presented adequate psychometric properties (α = 0.81 to 0.97), and an acceptable fit to a three-factor model in Spanish-speaking samples (Daza et al., 2002).

Table 1 Demographics in Time 1 and Time 2

Demographics	TIME 1 N = 490 participants	TIME 2 N = 84 participants
Gender	Female = 301 (62.4%) Male = 181 (37.6%)	Female = 63 (75%) Male = 21 (25%)
Age	18 = 173 (35.3%) 19 = 192 (39.4%) 20 = 124 (25.3%)	19 = 31 (36.9%) 20 = 34 (40.5%) 21 = 19 (22.6%)
Socioeconomic Status	Low = 148 (31.1%) Medium = 248 (52.1%) High = 80 (16.8%)	Low = 21 (25.9%) Medium = 54 (66.7%) High = 6 (7.4%)
Education	Primary education = 21 (4.3%) Secondary school = 209 (42.7%) University students = 260 (53%)	Primary education = 2 (2.4%) Secondary school = 19 (22.6%) University students = 63 (75%)
ACEs prevalence	Emotional abuse = 43 (8.8%) Physical abuse = 80 (16.3%) Sexual abuse = 49 (10%) Emotional neglect = 53 (10.9%) Physical neglect = 33 (6.7%) Parental Separation or Divorce = 128 (26.1%) Witnessing Domestic Violence = 37 (2.6%) Household Substance Abuse = 90 (18.4%) Household Mental Illness = 137 (28%) Incarcerated Relatives = 23 (4.7%)	Emotional abuse = 9 (10.7%) Physical abuse = 13 (15.5%) Sexual abuse = 8 (9.5%) Emotional neglect = 13 (15.5%) Physical neglect = 6 (7.1%) Parental Separation or Divorce = 23 (27.4%) Witnessing Domestic Violence = 5 (6%) Household Substance Abuse = 26 (31%) Household Mental Illness = 4 (4.8%) Incarcerated Relatives = 4 (4.8%)
Total ACE	Mean ACE $_{T1}$ = 1.37 (SD = 1.62)	Mean ACE $_{T2}$ = 1.42 (SD = 1.59)

Note. ACEs: Adverse Childhood Experiences

Table 2 Dependent Variables in Time 1 and Time 2

Variables	TIME 1 N = 490 participants	TIME 2 N = 84 participants	p-value
Deviant Behaviour	4.18 (0.15)	3.42 (0.14)	0.014[*]
Total DASS	0.80 (0.57)	0.98 (0.70)	0.020[*]
DASS Stress	1.07 (0.66)	1.23 (0.76)	0.081[†]
DASS Anxiety	0.68 (0.61)	0.83 (0.73)	0.076[†]
DASS Depression	0.67 (0.64)	0.93 (0.83)	0.004[*]

Note. DASS: Depression, Anxiety and Stress Scales; [*]$p \leq 05$; [†] < 0.1

between Time 1 and Time 2 was made according to the maximum number of variables recommended to be included in a regression based on the number of participants in the study (a minimum subject-to-predictor ratio ranging in value from 15-to-1 to 25-to-1), (Green, 1991; Schmidt, 1971). Due to the multiple comparisons carried out in Time 2, and to avoid an increase in the Type I error, the false discovery rate (FDR) method was used (Benjamini & Hocheberg, 1995).

Results

Demographics are shown in Table 1. No significant differences were noticed between the times for gender ($p = .320$), socioeconomic status ($p = .159$), or educational attainment ($p = .186$). However, significant differences were found between both times for age ($p = .000$). Finally, specific ACEs did not present differences among their percentages when Time 1 and Time 2 were compared by means of the z-statistic. Neither was the total ACE score statistically significant when comparing the samples at both time points ($p = .789$).

Regarding differences found among study variables (see Table 2), significant differences were observed in the deviant behaviour mean, noting a decrease in misbehaviour one year later. In addition, significant differences were also found between the total DASS value and DASS depression value, showing a rise in variables related to internalising problems one year later. Apart from that, marginal differences were observed in DASS stress and DASS anxiety in the same line as above, i.e., an increase in Time 2 compared with Time 1.

Predictive validity of total and specific ACEs

Then, linear regressions were performed with the different dependent variables of deviant behaviour, stress, depression and anxiety reported in Time 1 and 2 on the independent variables of gender, SES, and specific ACEs reported in Time (1) For Time 1 multiple linear regression was performed, and for Time 2, separate linear regressions were performed with three independent variables: gender, SES

Data analysis

First, frequencies, comparisons for paired samples and percentage comparisons were conducted to examine whether Time 1 and Time 2 differed in their reported demographics (gender, age, socioeconomic status and education) and in the study variables (deviant behaviour and internalising problems). Second, at Time 1, multiple linear regression models were also performed to determine whether each category of ACE was a predictor of internalising problems (total DASS, stress, anxiety and depression). All ACE items were included in one model for each internalising variable. At Time 2, separate linear regressions of each negative outcome (deviant behaviour and internalising problems) on each ACE item individually were carried out. Gender and SES were included in all regression models at both Time 1 and Time 2. This difference in the regression procedure

and specific ACE. Because of the space limit, gender and SES variables are not displayed in the regression models for Time 1 and (2) However, the cases in which any of these variables were significant, are discussed.

As for the DBVS, the authors of the present study reported the results in a previous article (Gomis-Pomares & Villanueva, 2020) with the initial sample (N=490). The results obtained in that study showed that gender (being a man) and having experienced adverse situations (particularly physical abuse) were the variables that predicted deviant behaviours during the previous year.

At Time 2, when the DBVS variable was considered (see Table 3), gender ($p = .002$) was a significant variable in all the different regressions when a specific ACE was taken into account. The only specific ACE at Time 1 that predicted deviant behaviour at Time 2 continued to be physical abuse. Thus, being male and having suffered from physical abuse during childhood increased the probability of developing deviant behaviour. The R^2 value at Time 1 was to 18.8% and at Time 2, the R^2 values ranged from 1.08 to 1.65% of the total variance.

Table 4 shows the prediction of each category of ACE on internalising problems (DASS variables). Physical abuse, household mental illness and incarcerated relatives were significant predictors of the existence of internalising problems at Time (1) In contrast, after FDR correction at Time 2, no variable was found to be significant. This means that specific ACEs experienced during Time 1 did not predict a higher level of DASS at Time (2) SES was also a significant variable at Time 1; however, neither SES nor gender were significant in any of the regressions performed at Time 2. These results indicate that having experienced several ACEs at Time 1 increases the odds of presenting internalising problems at Time 1, but not one year later (Time 2). The R^2 value at Time 1 was 11.1%, and at Time 2, the R^2 values ranged from 0.3 to 3.2% of the total variance.

Table 3 Separate Linear regression of each category of ACE_{T1} on $DBVS_{T2}$

	TIME 2			
	B	SE	*p*	*p-adj.*(FDR)
Emotional Abuse	0.02	0.05	0.662	0.945
Physical Abuse	0.11	0.04	0.005*	0.050*
Sexual Abuse	0.09	0.05	0.079†	0.395
Emotional Neglect	0.04	0.04	0.283	0.707
Physical Neglect	0.07	0.05	0.202	0.673
Parental Separation or Divorce	0.01	0.03	0.806	1.00
Witnessing Domestic Violence	0.03	0.06	0.549	1.09
Household Substance Abuse	0.00	0.04	0.961	0.961
Household Mental Illness	0.01	0.03	0.883	0.981
Incarcerated Relatives	0.04	0.07	0.554	0.923

Note. N = 84; B = Standardised regression coefficient; SE = Standard error; p-adj.(FDR) = False Discovery Rate correction; *p ≤ 05; † < 0.1

Taking into account each specific dimension of DASS (see Table 5) at Time 1, SES was a significant variable on the three internalising outcomes, and gender was significant only for stress. Regarding specific ACEs, physical abuse, sexual abuse, emotional neglect and household mental illness significantly predicted depressive problems, and two of them (physical abuse and household mental illness) also predicted anxiety. Stress problems were only predicted by household mental illness. However, at Time 2 and after FDR correction, it was found that neither gender, SES nor specific ACEs were significant variables in any of the regression models. At Time 1, R^2 values were 7.6% on stress symptoms, 6.7% on anxiety symptoms, and 13% on depressive symptoms. At Time 2, R^2 values ranged from 0.1 to 0.3% of the total variance in stress symptoms, from 0.7 to 3.5% of the total variance in anxiety, and from 0.3 to 8.8% of the total variance in depression.

Table 4 Multiple Linear regression of each category of ACE_{T1} on Total $DASS_{T1}$ and Separate Linear regressions of each category of ACE_{T1} on $DASS_{T2}$

	TIME 1			TIME 2			
	Multiple linear regression			Separate linear regressions			
	B	SE	*p*	B	SE	*p*	*p-adj.*(FDR)
Emotional Abuse	0.08	0.11	0.432	0.43	0.25	0.088†	0.440
Physical Abuse	0.21	0.08	0.010*	0.34	0.21	0.116	0.386
Sexual Abuse	15	0.09	0.084†	0.20	0.26	0.440	0.733
Emotional Neglect	0.15	0.09	0.111	0.14	0.21	0.497	0.710
Physical Neglect	0.16	0.12	0.175	0.63	0.29	0.036*	0.360
Parental Separation or Divorce	−0.06	0.06	0.275	0.20	0.18	0.267	0.667
Witnessing Domestic Violence	0.09	0.11	0.391	−0.01	0.33	0.967	0.967
Household Substance Abuse	0.02	0.07	0.740	−0.01	0.21	0.933	1.03
Household Mental Illness	0.20	0.06	0.001*	0.02	0.17	0.881	1.10
Incarcerated Relatives	−0.33	0.14	0.021*	0.36	0.37	0.326	0.652

Note. N = 84; B = Standardised regression coefficient; SE = Standard error; p-adj.(FDR) = False Discovery Rate correction; *p ≤ 05; † < 0.1.

Table 5 Multiple Linear regression of each category of ACE_{T1} on each dimension of $DASS_{T1}$ and Separate Linear regressions of each category of ACE_{T1} on $DASS_{T2}$

	TIME 1						TIME 2					
	Multiple linear regressions						Separate linear regression					
	DASS Stress		DASS Anxiety		DASS Depression		DASS Stress		DASS Anxiety		DASS Depression	
	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
Emotional Abuse	0.15	0.13	−0.01	0.12	0.04	0.12	0.47	0.27	0.38	0.26	0.45	0.30
Physical Abuse	0.16	0.09	0.18*	0.08	0.26*	0.08	0.33	0.23	0.37	0.22	0.32	0.25
Sexual Abuse	0.12	0.10	0.15	0.10	0.20*	0.10	0.14	0.28	0.13	0.28	0.34	0.31
Emotional Neglect	0.13	0.11	0.06	0.10	0.37*	0.10	−0.12	0.23	0.33	0.22	0.23	0.25
Physical Neglect	0.00	0.14	0.21†	0.13	0.22†	0.13	0.31	0.32	0.67	0.31	0.91	0.34
Parental Separation or Divorce	−0.11	0.07	−0.11†	0.06	−0.04	0.07	0.06	0.19	0.20	0.19	0.33	0.21
Witnessing Domestic Violence	0.08	0.13	0.01	0.12	0.13	0.12	−0.05	0.35	0.11	0.34	−0.09	0.39
Household Substance Abuse	0.11	0.09	0.07	0.08	−0.03	0.08	−0.05	0.23	−0.06	0.22	0.06	0.25
Household Mental Illness	0.19*	0.07	0.20*	0.06	0.21*	0.06	0.15	0.18	0.17	0.18	−0.08	0.20
Incarcerated Relatives	−0.22	0.16	−0.28†	0.15	−0.29†	0.15	0.20	0.40	0.58	0.38	0.31	0.44

$N = 84$; $B =$ Standardised regression coefficient; $SE =$ Standard error; *$p ≤ 05$; † < 0.1.

Discussion

This research aimed to explore the long-term impact of specific ACEs on deviant behaviour and internalising outcomes (depression, anxiety and stress) across a longitudinal study in a Spanish community of young adults.

The rationale for this study stemmed from the finding that the exposure to multiple ACEs was not informative enough, failing to provide significant associations with different outcomes (Craig et al., 2022; Raffaelli et al., 2018). We have to take into account that the total score of ACEs in the questionnaire used in this study is composed of ten diverse negative events and that half of them pertain to household dysfunctions. That is, when we take into account the effect of exposure to numerous adverse events, we may miss the specific subtleties of each ACE. Moreover, in the household dimension, some authors even reached counterintuitive results: young adults with family members with mental illness and exposed to domestic violence in their childhood presented a lower probability of substance abuse than adults with low levels of these household dysfunctions (Villanueva & Gomis-Pomares, 2021). This type of result has also emerged with different predicted variables and cultural contexts (Barrera et al., 2016; Mersky et al., 2017; Sharp et al., 2012). A tentative explanation may focus on some youths' compensatory factors, such as precocious maturity or the ability to think and act separately from their parents´ problems (Beardslee & Podorefsky, 1988). The assumption is that the ten adverse childhood experiences may deploy different influences in diverse directions, even counteracting their impacts. In summary, the apparently contradictory results on the associations between the cumulative effect of ACEs and the negative outcomes, which deserve more nuanced research, reinforce the need for a complementary differential approach to specific ACEs being associated with specific negative outcomes.

In particular, the first hypothesis addresses the differential approach of specific ACEs, which analyses the mechanisms through which adversities might affect outcomes. The hypothesis expected that of all ACEs, physical abuse would be the main predictor of deviant behaviours, and neglect would be the relevant factor associated with internalising outcomes, similar to what happens in childhood and adolescence. Regarding the first part of the hypothesis, the results fully supported the assumption about externalising outcomes. Physical abuse was the only significant predictor of deviant behaviours in both time periods of emerging adulthood. This finding is consistent with previous studies, in which either in conjunction with other specific ACEs (Schilling et al., 2007; Widom, 1989) or alone (Gomis-Pomares & Villanueva, 2020; Smith et al., 2005), physical

abuse demonstrated its detrimental and pervasive effect on externalising outcomes (offending, deviant behaviour, etc.).

These results can be explained by social learning processes, such as modelling and differential reinforcement (Widow, 1989); that is, children who have been victims of violence may imitate the same pattern of behaviours (cycle of violence). Consequently, from a developmental point of view, it is logical to consider that children experiencing physical abuse have come to develop maladjusted externalising strategies in middle childhood (Hildyard & Wolfe, 2002), and therefore continue to adopt the same subset of externalising strategies in emerging adulthood if no intervention is carried out to prevent this trajectory (Braga et al., 2018).

Regarding the second part of the hypothesis, namely, that neglect would be the relevant factor associated with internalising outcomes (depression, anxiety and stress), this was not supported by the results. While physical abuse and having a family member with a mental illness were the common significant predictors across the total score of internalising problems and their specific subdimensions (anxiety and depression) at Time 1, no specific ACEs was significant predictor of any of these scores at Time 2. That is, only physical abuse and household mental illness during childhood were significantly related to the development of depressive and anxious symptoms in young adulthood.

The presence of childhood physical abuse as a predictor of internalising problems is consistent with some previous studies (Gardner et al., 2019; Schilling et al., 2007). However, its relation with internalising outcomes is not as strong and stable as that shown with externalising outcomes. While physical abuse seems to present a stable and independent relation with deviant behaviour (at Time 1 and Time 2), the relation with internalising problems seems to be less univocal (as other ACEs are also significant predictors, of the specific dimension of depressive symptoms, namely, sexual abuse, emotional neglect and household mental illness), and less stable (no significant specific ACEs for internalising outcomes at Time 2). Internalising outcomes seem to have a broader multifactorial association with distinct types of ACEs, which may suggest that the cumulative effect of ACEs is a more salient risk factor for internalising problems. In this sense, the detection of the cumulative deleterious effects of ACEs on internalising outcomes may be especially blurred due to their "lack of specialisation" (Gomis-Pomares & Villanueva, 2022).

Finally, the second hypothesis posited that the specific relations found between types of maltreatment and internalising and externalising problems would show continuity after a one-year follow-up period. The obtained results about externalising outcomes supported this hypothesis, showing the long-term effects of ACEs and their strong stability even

one year later. Significant decreases in deviant behaviour could be observed in this age period after a year, which may be attributed to a post COVID period (de-escalation) of data collection, but it is also certain that this decrease is fully consistent with the age crime curve (Farrington, 1986). Therefore, it can reliably be said that the negative consequences of childhood physical abuse were still difficult to dissipate over time; its effect on externalising outcomes was present in both time periods. As stated before, once established, learned patterns of violence in childhood and adolescence are difficult to eliminate, especially if intervention is not implemented.

The continuity posited for internalising outcomes was not exactly supported by the results, and divergences between Time 1 and Time 2 were found. While several ACEs were found to be predictors of internalising problems at Time 1, no specific ACEs appeared to be a significant predictor of internalising outcomes at Time 2. In this case, it is worth noting that there was not a decrease but a significant increase in internalising problems over time in this age period, which could also be associated with the harsh time period (post COVID) of data collection. However, this increase in internalising problems is again theoretically supported. Contrary to the trajectory of externalising problems, which decrease as participants enter adulthood, the prevalence of internalising outcomes remains stable or even increases with age (Adams et al., 2014; Solmi et al., 2022).

This is in line with the information about the high stability of pathways to internalising problems, even observed in people in their sixties who have suffered ACEs (Ege et al., 2015). Internalising outcomes may emerge as a multifactorial result, resulting from the cumulative effect of ACEs, but once present, they tend to be stable over time. In fact, adverse childhood events seem to be linked with a poorer prognosis and treatment response among adults with these types of internalising problems (Liu et al., 2017). More specifically, Paterniti et al. (2017) found that physical neglect, predicted a slower rate of remission/recovery in clinical depressive patients. Future longitudinal studies should analyse the continuity of the internalising problems associated to specific ACEs in larger samples of young adult participants.

Finally, some limitations of this study are worth noting. First, the inclusion of complementary approaches to the study of ACEs (cumulative, differential and in combination) are needed to present a more realistic picture of the situation. Similarly, we should overcome the conceptualisation of ACEs as binary categories (experienced/not experienced), (Lacey & Minnis, 2020) and obtain additional information about the victim age, intensity, frequency, and duration of the maltreatment or even the specific perpetrator of each negative experience. For example, some authors have suggested that the sex-specific impact of parental models may

play a role in children (Basto-Pereira et al., 2022). Further studies must focus on these parameters, which surely make a difference in the impact of the negative experience. Moreover, and despite the difficulties that it poses, future research would need to complement ACE retrospective self-reports (as in this study), with more objective retrospective information extracted from different resources, such as child protection systems, mental health services, police records, etc. Finally, although the attrition rate in this study was extremely high,several explanations may contribute to understanding this phenomenon. Some studies have reported attrition rates ranging from 5 to 70% (Marcellus, 2004), even especially high in this age group when compared to middle and older participants (Young et al., 2006). The age period analysed in this study belongs to the emerging adulthood, a transitional phase characterised by changes in education, employment, financial circumstances or opportunities for travel which may lead to more difficulties to trace them and more opportunities to lose contact (Young et al., 2006). In addition, the way the questionnaires were administered in Time 2 (online), and the use of the email for the contact (versus mobile phone numbers which are becoming more stable in comparison), may have also increased the attrition rate.

Despite the inherent limitations present in all studies, this work contributes to offering a differential impact of ACEs in an age period in which externalising and internalising problems are at their peak: emerging adulthood. The already classical differential effects of physical abuse in childhood and adolescent development (Hildyard & Wolfe, 2002; McLaughlin & Sheridan, 2016), have also been supported here in later life periods. In a highly stable relation, child physical abuse was associated with externalising outcomes (deviant behaviour), and in a less highly stable relation, physical and sexual abuse, emotional neglect and household mental illness were associated with internalising problems at Time 1. That is, both threat and deprivation situations may have extraordinary detrimental and pervasive effects (McLaughlin et al., 2014). In the specific case of internalising problems, the combination of threat and deprivation events mainly suggests that experiencing multiple ACEs may also be a risk factor for the expression of internalising problems (lack of specialisation).

These findings may help to build prevention and intervention programmes aimed at stopping the emergence and stability of maladaptive coping strategies when facing ACEs and their possible intergenerational transmission. In this line, the adoption of trauma-informed approaches (Branson et al., 2017; Roseby & Gascoigne, 2021) in all the child daily settings (school, residential care, youth detention centres, and so on), may help explain the underlying mechanisms of many problematic behaviours and, in this way, minimise secondary victimisation and improve our children's lives.

As Felitti (2009) stated about ACEs, "they are generally unrecognised and become lost in time, where they are protected by shame, by secrecy, and by social taboos (p. 131)". It is our job and that of practitioners to protect children from these experiences and, in that way, also protect future adults from the consequences of these experiences.

Declarations

References

Adams, S. H., Knopf, D. K., & Park, M. J. (2014). Prevalence and treatment of mental health and substance use problems in the early emerging adult years in the United States: Findings from the 2010 National Survey on Drug Use and Health. *Emerging Adulthood*, *2*(3), 163–172. https://doi.org/10.1177/2167696813513563.

Allem, J. P., Soto, D. W., Baezconde-Garbanati, L., & Unger, J. B. (2015). Adverse childhood experiences and substance use among Hispanic emerging adults in Southern California. *Addictive Behaviors*, 50, 199–204. https://doi.org/10.1016/j.addbeh.2015.06.038

Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfeld, C. H., Perry, B. D., Dube, R., & Giles, W. H. (2006). The enduring efects of abuse and related adverse experiences in childhood. *European Archives of Psychiatry and Clinical Neuroscience*, *256*(3), 174–186. https://doi.org/10.1007/s00406-005-0624-4

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*(5), 469–480. https://doi.org/10.1037/0003-066X.55.5.469.

Barnes, A. J., Anthony, B. J., Karatekin, C., Lingras, K. A., Mercado, R., & Thompson, L. A. (2020). Identifying adverse childhood experiences in pediatrics to prevent chronic health conditions. *Pediatric Research*, *87*(2), 362–370. https://doi.org/10.1038/s41390-019-0613-3.

Barrera, D. J., Gaga-a, B., & Pabayos, J. (2016). Negative life events and maladaptive behaviors among filipino adolescents: An empirical test of the general strain theory. *Asian Journal of Criminology*, *11*(4), 265–287. https://doi.org/10.1007/s11417-016-9230-9.

Basto-Pereira, M., Miranda, A., Ribeiro, S., & Maia, Â. (2016). Growing up with adversity: From juvenile justice involvement to criminal persistence and psychosocial problems in young adulthood.

Child Abuse & Neglect, *62*, 63–75. https://doi.org/10.1016/j.chiabu.2016.10.011.

Basto-Pereira, M., Queiroz-Garcia, I., Maciel, L., Leal, I., & Gouveia-Pereira, M. (2020). An international study of pro/antisocial behavior in young adults. *Cross-Cultural Research*, *54*(1), 92–105. https://doi.org/10.1177/1069397119850741.

Basto-Pereira, M., Gouveia-Pereira, M., Pereira, C. R., Barrett, E. L., Lawler, S., Newton, N., & Sakulku, J. (2022). The global impact of adverse childhood experiences on criminal behavior: A cross-continental study. *Child Abuse & Neglect*, *124*, 105459. https://doi.org/10.1016/j.chiabu.2021.105459.

Beardslee, W., & Podorefsky, D. (1988). Resilient adolescents whose parents have serious affective and other psychiatric disorders: Importance of self-understanding and relationships. *The American Journal of Psychiatry*, *145*(1), 63–69. https://doi.org/10.1176/ajp.145.1.63.

Bellis, M. A., Lowey, H., Leckenby, N., Hughes, K., & Harrison, D. (2014). Adverse childhood experiences: Retrospective study to determine their impact on adult health behaviours and health outcomes in a UK population. *Journal of Public Health*, *36*(1), 81–91. https://doi.org/10.1093/pubmed/fdt038.

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society: series B (Methodological)*, *57*(1), 289–300. https://doi.org/10.1111/j.2517-6161.1995.tb02031.x.

Braga, T., Cunha, O., & Maia, Â. (2018). The enduring effect of maltreatment on antisocial behavior: A meta-analysis of longitudinal studies. *Aggression and Violent Behavior*, *40*, 91–100. https://doi.org/10.1016/j.avb.2018.04.003.

Branson, C. E., Baetz, C. L., Horwitz, S. M., & Hoagwood, K. E. (2017). Trauma-informed juvenile justice systems: A systematic review of definitions and core components. *Psychological Trauma: Theory Research Practice and Policy*, *9*(6), 635–646. https://doi.org/10.1037/tra0000255.

Brown, D. W., Anda, R. F., Tiemeier, H., Felitti, V. J., Edwards, V. J. Croft, J. B., & Giles, W. H. (2009). Adverse childhood experiences and the risk of premature mortality. *American Journal of Preventive Medicine*, *37*(5), 389–396. https://doi.org/10.1016/j.amepre.2009.06.021

Campbell, J. A., Walker, R. J., & Egede, L. E. (2016). Associations between adverse childhood experiences, high-risk behaviors, and morbidity in adulthood. *American Journal of Preventive Medicine*, *50*(3), 344–352. https://doi.org/10.1016/j.amepre.2015.07.022.

Craig, J. M., Wolff, K. T., & Baglivio, M. T. (2022). Clustering of adverse and positive childhood experiences: The nature and correlates of risk and protective factors. *Child Abuse & Neglect*, *134*, 105878. https://doi.org/10.1016/j.chiabu.2022.105878.

Daza, P., Novy, D. M., Stanley, M. A., & Averill, P. (2002). The depression anxiety stress scale-21: Spanish translation and validation with a hispanic sample. *Journal of Psychopathology and Behavioral Assessment*, *24*(3), 195–205.

Degli Esposti, M., Pereira, S. M. P., Humphreys, D. K., Sale, R. D., & Bowes, L. (2020). Child maltreatment and the risk of antisocial behaviour: A population-based cohort study spanning 50 years. *Child Abuse & Neglect*, *99*, 104281. https://doi.org/10.1016/j.chiabu.2019.104281.

Dong, M., Anda, R. F., Felitti, V. J., Dube, S. R., Williamson, D. F., Thompson, T. J., & Giles, W. H. (2004). The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. *Child Abuse & Neglect*, *28*(7), 771–784. https://doi.org/10.1016/j.chiabu.2004.01.008.

Dube, S. R., Fairweather, D., Pearson, W. S., Felitti, V. J., Anda, R. F., & Croft, J. B. (2009). Cumulative childhood stress and autoimmune diseases in adults. *Psychosomatic Medicine*, *71*(2), 243–250.

https://doi.org/10.1016/S0749-3797(98)00017-810.1097/PSY.0b013e3181907888.

Dube, S. R., Felitti, V. J., Dong, M., Chapman, D. P., Giles, W. H., & Anda, R. F. (2003a). Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: The adverse childhood experiences study. *Pediatrics*, *111*(3), 564–572. https://doi.org/10.1542/peds.111.3.564.

Dube, S. R., Felitti, V. J., Dong, M., Giles, W. H., & Anda, R. F. (2003b). The impact of adverse childhood experiences on health problems: Evidence from four birth cohorts dating back to 1900. *Preventive Medicine*, *37*(3), 268–277. https://doi.org/10.1016/S0091-7435(03)00123-3.

Ege, M. A., Messias, E., Thapa, P. B., & Krain, L. P. (2015). Adverse childhood experiences and geriatric depression: Results from the2010 BRFSS. *The American Journal of Geriatric Psychiatry*, *23*(1), 110–114. https://doi.org/10.1016/j.jagp.2014.08.014.

Farrington, D. P. (1986). Age and crime. *Crime and Justice*, *7*, 189–250.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine*, *14*(4), 245–258. https://doi.org/10.1016/S0749-3797(98)00017-8.

Felitti, V. J. (2009). Adverse childhood experiences and adult health. *Academic Pediatrics*, *9*(3), 131–132.

Finkelhor, D., Turner, H., Hamby, S., & Ormrod, R. (2011). *Polyvictimization: Multiple exposures to violence in a national sample of children*. Juvenile Justice Bulletin - NCJ235504. Department of Justice.

Forster, M., Grigsby, T. J., Rogers, C. J., & Benjamin, S. M. (2018). The relationship between family-based adverse childhood experiences and substance use behaviors among a diverse sample of college students. *Addictive Behaviors*, *76*, 298–304. https://doi.org/10.1016/j.addbeh.2017.08.037.

Gardner, M. J., Thomas, H. J., & Erskine, H. E. (2019). The association between five forms of child maltreatment and depressive and anxiety disorders: A systematic review and meta-analysis. *Child Abuse & Neglect*, *96*, 104082. https://doi.org/10.1016/j.chiabu.2019.104082.

Gomis-Pomares, A., Villanueva, L., & Basto-Pereira, M. (2022). Psychometric properties of the deviant Behavior Variety Scale in young spanish adults. *Psicothema*, *34*(2), 308–315. https://doi.org/10.7334/psicothema2021.317.

Gomis-Pomares, A., & Villanueva, L. (2020). The effect of adverse childhood experiences on deviant and altruistic behavior during emerging adulthood. *Psicothema*, *32*(1), 33–39. https://doi.org/10.7334/psicothema2019.142.

Green, S. B. (1991). How many subjects does it take to do a regression analysis. *Multivariate Behavioral Research*, *26*(3), 499–510.

Grummitt, L. R., Kelly, E. V., Barrett, E. L., Lawler, S., Prior, K., Stapinski, L. A., & Newton, N. C. (2022). Associations of childhood emotional and physical neglect with mental health and substance use in young adults. *Australian & New Zealand Journal of Psychiatry*, *56*(4), 365–375. https://doi.org/10.1177/00048674211025691.

Hardt, J., & Rutter, M. (2004). Validity of adult retrospective reports of adverse childhood experiences: Review of the evidence. *Journal of Child Psychology and Psychiatry*, *45*(2), 260–273. https://doi.org/10.1111/j.1469-7610.2004.00218.x.

Hardt, J., Vellaisamy, P., & Schoon, I. (2010). Sequelae of prospective versus retrospective reports of adverse childhood experiences. *Psychological Reports*, *107*(2), 425–440. https://doi.org/10.2466/02.04.09.10.16.21.PR0.107.5.425-44.

Hildyard, K. L., & Wolfe, D. A. (2002). Child neglect: Developmental issues and outcomes. *Child Abuse & Neglect*, *26*(6–7), 679–695. https://doi.org/10.1016/S0145-2134(02)00341-1.

Hofstede, G. (1980). Culture and organizations. *International Studies of Management & Organization*, *10*(4), 15–41.

Holden, G. W., Gower, T., & Chmielewski, M. (2020). Methodological considerations in ACEs research. In G. J. G. Asmundson, & T. O. Afifi (Eds.), *Adverse childhood experiences: Using evidence to advance research, practice, policy, and prevention* (pp. 161–182). Academic Press.

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., Jones, L., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. *The Lancet Public Health*, *2*(8), e356–e366. https://doi.org/10.1016/S2468-2667(17)30118-4.

Humphreys, K. L., LeMoult, J., Wear, J. G., Piersiak, H. A., Lee, A., & Gotlib, I. H. (2020). Child maltreatment and depression: A meta-analysis of studies using the Childhood Trauma Questionnaire. *Child Abuse & Neglect*, *102*, 104361. https://doi.org/10.1016/j.chiabu.2020.104361.

Informe del Instituto Nacional de Estadística. (2022). *Estadística de Condenados: Adultos/Menores. Año 2021 [Convicted Statistics: Adults/ minors. Year 2021]*. Spanish Statistical Institute.

Infurna, M. R., Reichl, C., Parzer, P., Schimmenti, A., Bifulco, A., & Kaess, M. (2016). Associations between depression and specific childhood experiences of abuse and neglect: A meta-analysis. *Journal of Affective Disorders*, *190*, 47–55. https://doi.org/10.1016/j.jad.2015.09.006.

Kaminer, D., Bravo, A. J., Mezquita, L., & Pilatti, A. (2022). Adverse childhood experiences and adulthood mental health: A cross-cultural examination among university students in seven countries. *Current Psychology*. https://doi.org/10.1007/s12144-022-02978-3.

Kessler, R. C., Petukhova, M., Sampson, N. A., Zaslavsky, A. M., & Wittchen, H. U. (2012). Twelve-month and lifetime prevalence and lifetime morbid risk of anxiety and mood disorders in the United States. *International Journal of Methods in Psychiatric Research*, *21*(3), 169–184. https://doi.org/10.1002/mpr.1359.

Lacey, R. E., & Minnis, H. (2020). Practitioner review: Twenty years of research with adverse childhood experience scores–advantages, disadvantages and applications to practice. *Journal of Child Psychology and Psychiatry*, *61*(2), 116–130. https://doi.org/10.1111/jcpp.13135.

Lacey, R. E., Howe, L. D., Kelly-Irving, M., Bartley, M., & Kelly, Y. (2022). The clustering of adverse childhood experiences in the Avon Longitudinal Study of parents and children: Are gender and poverty important? *Journal of Interpersonal Violence*, *37*(5–6), 2218–2241. https://doi.org/10.1177/0886260520935096.

Liming, K. W., & Grube, W. A. (2018). Wellbeing outcomes for children exposed to multiple adverse experiences in early childhood: A systematic review. *Child and Adolescent Social Work Journal*, *35*, 317–335. https://doi.org/10.1007/s10560-018-0532-x.

Liu, J., Mustanski, B., Dick, D., Bolland, J., & Kertes, D. A. (2017). Risk and protective factors for comorbid internalizing and externalizing problems among economically disadvantaged african american youth. *Development and Psychopathology*, *29*(3), 1043–1056. https://doi.org/10.1017/S0954579416001012.

Loxton, D., Townsend, N., Dolja-Gore, X., Forder, P., & Coles, J. (2019). Adverse childhood experiences and healthcare costs in adult life. *Journal of Child Sexual Abuse*, *28*(5), 511–525. https://doi.org/10.1080/10538712.2018.1523814.

Malvaso, C. G., Cale, J., Whitten, T., Day, A., Singh, S., Hackett, L., Delfabbro, P. H., & Ross, S. (2021). Associations between adverse childhood experiences and trauma among young people who offend: A systematic literature review. *The Bulletin of the National Association of Secondary School Principals*, *0*(0), 32–38. https://doi.org/10.1177/019263654703114605.

Marcellus, L. (2004). Are we missing anything? Pursuing research on attrition. *Canadian Journal of Nursing Research Archive*, *36*(3), 82–98.

McLaughlin, K. A., Sheridan, M. A., & Lambert, H. K. (2014). Childhood adversity and neural development: Deprivation and threat as distinct dimensions of early experience. *Neuroscience & Biobehavioral Reviews*, *47*, 578–591. https://doi.org/10.1016/j.neubiorev.2014.10.012.

McLaughlin, K. A., & Sheridan, M. A. (2016). Beyond cumulative risk: A dimensional approach to childhood adversity. *Current Directions in Psychological Science*, *25*(4), 239–245. https://doi.org/10.1177/0963721416655883.

Mersky, J. P., Janczewski, C. E., & Topitzes, J. (2017). Rethinking the measurement of adversity: Moving toward second-generation research on adverse childhood experiences. *Child Maltreatment*, *22*(1), 58–68. https://doi.org/10.1177/1077559516679513.

Murphy, A., Steele, M., Dube, S. R., Bate, J., Bonuck, K., Meissner, P., Godman, H., & Steele, H. (2014). Adverse childhood experiences (ACEs) questionnaire and adult attachment interview (AAI): Implications for parent child relationships. *Child Abuse & Neglect*, *38*(2), 224–233. https://doi.org/10.1016/j.chiabu.2013.09.004.

Myers, B., Bantjes, J., Lochner, C., Mortier, P., Kessler, R. C., & Stein, D. J. (2021). Maltreatment during childhood and risk for common mental disorders among first year university students in South Africa. *Social Psychiatry and Psychiatric Epidemiology*, *56*(7), 1175–1187. https://doi.org/10.1007/s00127-020-01992-9.

Nurius, P. S., Green, S., Logan-Greene, P., & Borja, S. (2015). Life course pathways of adverse childhood experiences toward adult psychological well-being: A stress process analysis. *Child Abuse & Neglect*, *45*, 143–153. https://doi.org/10.1016/j.chiabu.2015.03.008.

Paterniti, S., Sterner, I., Caldwell, C., & Bisserbe, J. C. (2017). Childhood neglect predicts the course of major depression in a tertiary care sample: A follow-up study. *Bmc Psychiatry*, *17*(1), 113. https://doi.org/10.1186/s12888-017-1270-x.

Pereda, N., Guilera, G., & Abad, J. (2014). Victimización infanto-juvenil en España: Una revisión sistemática de estudios epidemiológicos [Child and adolescent victimization in Spain: A systematic review of epidemiological studies]. *Papeles del Psicólogo*, *35*(1), 66–77.

Raffaelli, M., Santana, J. P., De Morais, N. A., Nieto, C. J., & Koller, S. H. (2018). Adverse childhood experiences and adjustment: A longitudinal study of street-involved youth in Brazil. *Child Abuse & Neglect*, *85*, 91–100. https://doi.org/10.1016/j.chiabu.2018.07.032.

Rose, S. J., & Meezan, W. (1996). Variations in perceptions of child neglect. *Child Welfare*, 139–160.

Roseby, S., & Gascoigne, M. (2021). A systematic review on the impact of trauma-informed education programs on academic and academic-related functioning for students who have experienced childhood adversity. *Traumatology*, *27*(2), 149–167. https://doi.org/10.1037/trm0000276.

Sanches, C., Gouveia-Pereira, M., Marôco, J., Gomes, H., & Roncon, F. (2016). Deviant behavior variety scale: Development and validation with a sample of portuguese adolescents. *Psicologia: Reflexão e Crítica*, *29*(1), 1–8. https://doi.org/10.1186/s41155-016-0035-7.

Schilling, E. A., Aseltine, R. H., & Gore, S. (2007). Adverse childhood experiences and mental health in young adults: A longitudinal survey. *Bmc Public Health*, *7*(1), 1–10. https://doi.org/10.1186/1471-2458-7-30.

Schmidt, F. L. (1971). The relative efficiency of regression in simple unit predictor weights in applied differential psychology. *Educational and Psychological Measurement*, *31*, 699–714.

Sharp, S. F., Peck, B. M., & Hartsfeld, J. (2012). Childhood adversity and substance use of women prisoners: A general strain theory approach. *Journal of Criminal Justice*, *40*(3), 202–211. https://doi.org/10.1016/j.jcrimjus.2012.01.003.

Smith, C. A., Ireland, T. O., & Thornberry, T. P. (2005). Adolescent maltreatment and its impact on young adult antisocial behavior. *Child Abuse & Neglect*, *29*(10), 1099–1119. https://doi.org/10.1016/j.chiabu.2005.02.011.

Solmi, M., Radua, J., Olivola, M., Croce, E., Soardo, L., Salazar de Pablo, G., & Fusar-Poli, P. (2022). Age at onset of mental disorders worldwide: Large-scale meta-analysis of 192 epidemiological studies. *Molecular Psychiatry*, *27*(1), 281–295. https://doi.org/10.1038/s41380-021-01161-7.

Villanueva, L., & Gomis-Pomares, A. (2021). The cumulative and differential relation of adverse childhood experiences and substance use during emerging adulthood. *Child Psychiatry & Human Development*, *52*(3), 420–429. https://doi.org/10.1007/s10578-020-01029-x.

Widom, C. S. (1989). The cycle of violence. *Science*, *244*(4901), 160–166. https://doi.org/10.1126/science.2704995.

Young, A. F., Powers, J. R., & Bell, S. L. (2006). Attrition in longitudinal studies: Who do you lose? *Australian and New Zealand Journal of Public Health*, *30*(4), 353–361.