Psychological Medicine

cambridge.org/psm

The association of adverse childhood experiences with long-term outcomes of psychosis: a 21-year prospective cohort study after a first episode of psychosis

Victor Peralta[1,2], Elena García de Jalón[1,2], Lucía Moreno-Izco[2,3], David Peralta[1], Lucía Janda[1], Ana M. Sánchez-Torres[2,4], Manuel J. Cuesta[2,3] and SEGPEPs group[1,*]

[1]Mental Health Department, Servicio Navarro de Salud, Pamplona, Spain; [2]Instituto de Investigación Sanitaria de Navarra (IdiSNA), Pamplona, Spain; [3]Department of Psychiatry, Complejo Hospitalario de Navarra, Pamplona, Spain and [4]Departamento de Ciencias de la Salud, Universidad Pública de Navarra (UPNA), Campus de Arrosadia, Pamplona, España

Original Article

Cite this article: Peralta V, García de Jalón E, Moreno-Izco L, Peralta D, Janda L, Sánchez-Torres AM, Cuesta MJ, SEGPEPs group (2024). The association of adverse childhood experiences with long-term outcomes of psychosis: a 21-year prospective cohort study after a first episode of psychosis. *Psychological Medicine* 1–10. https://doi.org/10.1017/S0033291724001223

Received: 18 October 2023
Revised: 22 April 2024
Accepted: 29 April 2024

Keywords:
childhood adversity; first-episode psychosis; long-term follow-up; outcome

Corresponding author:
Victor Peralta;
Email: victor.peralta.martin@cfnavarra.es

Abstract

Background. Evidence suggests a possible relationship between exposure to childhood adversity (CA) and functional impairment in psychosis. However, the impact of CA on long-term outcomes of psychotic disorders remains poorly understood.

Methods. Two hundred and forty-three patients were assessed at their first episode of psychosis for CA and re-assessed after a mean of 21 years of follow-up for several outcome domains, including symptoms, functioning, quality of life, cognitive performance, neurological dysfunction, and comorbidity. The unique predictive ability of CA exposure for outcomes was examined using linear regression analysis controlling for relevant confounders, including socioeconomic status, family risk of schizophrenia, and obstetric complications.

Results. There were 54% of the patients with a documented history of CA at mild or higher levels. CA experiences were more prevalent and severe in schizophrenia than in other psychotic disorders ($p < 0.001$). Large to very large effect sizes were observed for CA predicting most role functioning variables and negative symptoms (ΔR^2 between 0.105 and 0.181). Moderate effect sizes were observed for positive symptoms, personal functioning, impaired social cognition, impaired immediate verbal learning, poor global cognition, internalized stigma, poor personal recovery, and drug abuse severity (ΔR^2 between 0.040 and 0.066). A dose–response relationship was observed between levels of CA and severity of outcome domains.

Conclusion. Our results suggest a strong and widespread link between early adversity exposure and outcomes of psychotic disorders. Awareness of the serious long-term consequences of CA should encourage better identification of those at risk and the development of effective interventions.

Introduction

Childhood maltreatment encompasses any acts of commission or omission by a parent or other caregiver that result in harm, potential for harm, or threat of harm to a child, even if harm is not the intended result (Leeb, Paulozzi, Melanson, Simon, & Arias, 2008). It includes children's exposure to a range of adverse experiences including physical abuse, sexual abuse, emotional abuse, and neglect. Childhood adversity (CA) is an even broader term that also encompasses issues such as parental separation and divorce, domestic violence, and disruptions in caregiving. Some estimates of the frequency of CA worldwide suggest that about one-third of the general population is affected (Kessler et al., 2010), which poses a public health problem of great concern. In people with psychotic disorders, the problem is even greater, since almost 60% of this population experience moderate-to-severe maltreatment (Struck et al., 2020). A study on the global population-attributable fraction (PAF) of potentially modifiable risk factors for mental disorders concluded that the largest global PAF was 37.8% for CA and schizophrenia spectrum disorders (SSD) (Dragioti et al., 2022). CA experiences are understood to be highly intercorrelated, and when factored together, robustly predict a broad range of psychopathological and physical problems across the life course (Felitti et al., 1998; Norman et al., 2012).

Despite increasing evidence pointing to the role of CA in the development, manifestations, and outcomes of psychotic disorders, its specific effects on the long-term outcome of psychotic disorders remain poorly understood. In recent years, two systematic reviews (Cotter, Kaess, & Yung, 2015; Rodriguez et al., 2021) and three meta-analyses of mainly cross-sectional studies

have addressed this question with variable results. While one meta-analysis concluded that the effect of childhood trauma on the evolution of first-episode psychosis (FEP) is unclear (Vila-Badia et al., 2022), others reported that childhood maltreatment was negatively associated with social functioning, but unrelated to independent living or occupational functioning (Fares-Otero et al., 2023). The most comprehensive meta-analysis to date focusing on prospective assessment of outcomes provided evidence for an association between general childhood adversity, specific subtypes, and poor psychosocial functioning (Christy et al., 2023). Notably, this meta-analysis included individual studies with a follow-up period of 1 month to 5 years; such a variable and short-term follow-up is of particular concern because the association between CA and functional outcome appears stronger over time (Rodriguez et al., 2021). Findings from FEP studies longitudinally examining the impact of adversity on functioning are also mixed. For instance, Alameda et al. (2015) showed long-lasting detrimental effects on functioning up to 3 years of follow-up, while neither Trotta et al. (2016) nor Ajnakina et al. (2018) found such effects at 1-year and 5-year follow-ups, respectively. Furthermore, most previous studies on the topic did not consider important confounders such as socioeconomic status, familial risk of severe mental disorders, or obstetric complications, and none considered these confounders conjointly, which may partially explain the divergence in findings.

The association of childhood adversity with outcome domains other than symptoms and functioning has not been examined using a very long-term follow-up of FEP. In two previous studies from our group, using a cohort of 243 FEP patients who were followed-up for a mean of 21 years, we found that CA predicted nonrecovery (Peralta et al., 2022) and clinical staging (Peralta et al., 2023). Using the same population of psychotic disorders, the main goal of the present study was to examine the unique predictive ability of a continuous measure of CA on 27 outcome domains and subdomains, including symptoms, role functioning, quality of life, cognitive impairment, neurological dysfunction, and comorbidity, each rated at the final follow-up assessment. Secondary aims were to assess the dose–response relationship of an ordinal measure of CA with outcomes and to examine the prevalence and severity of CA across specific diagnoses of psychotic disorders.

Method

Study population

The study sample comprised participants from a longitudinal cohort study who were consecutively admitted for treatment of FEP (data collected from 1990 to 2008) and prospectively reassessed for several outcome domains (data collected from 2018 to 2021). Of the 510 patients assessed at baseline, 243 were successfully followed-up (46.4% of the initial sample and 57.3% of the survivors) and made the study sample. The followed and non-followed subjects did not differ in the main demographic and clinical variables (Peralta et al., 2022). All participants and their legal representatives, if appropriate, signed written informed consent forms, and the local ethics committee granted ethical approval. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

A detailed description of the study methodology has been provided elsewhere (Peralta et al., 2022, 2021). The main instrument for assessing background, clinical course, diagnosis, and some outcome variables was the Comprehensive Assessment of Symptoms and History (CASH) (Andreasen, 1987, 1992), and for variables used in the present study not included in the CASH, specific assessment instruments were employed (see below). The main sociodemographic and clinical characteristics of the participants are shown in online Supplementary Table S1.

Assessment of CA

We assessed CA using the Global Family Environment Scale (GFES) (Rey et al., 1997). The scale seeks retrospectively to quantify the adequacy of the environment in which a child was reared during the first 12 years of life and rates the worst 12 months. The construct measured by the GFES indexes psychosocial adversity, as measured by the Psychosocial Adversity Index (Rey et al., 1997). The GFES is a single-score measure with a structure similar to the Global Assessment of Functioning (GAF) scale, which is rated on a hypothetical continuum from 1 to 90 depending on the quality of the family environment the child was brought up with higher ratings indicating less adversity. For example, scores of 81–90 indicate an adequate family environment that is stable, secure, and nurturing for the child with consistent care, affection, and discipline; scores of 31–50 reflect poor family environment, persistent parental discord, hostile separation, exposure to more than one step parent, some abuse or neglect, and poor supervision; and scores of 1–10 reflect a very disturbed family environment, often resulting in the child being made a ward of the state, and evidence of severe abuse, or neglect, or severe deprivation are present.

The GFES has been validated in Spanish by our group and has been shown to have adequate reliability (intraclass correlation coefficient = 0.83) (Rey et al., 2000). The scale has shown good convergent validity with other rating scales that assess CA (Du Rocher Schudlich et al., 2015; Hawes et al., 2021; Marques-Feixa et al., 2023). The senior authors (VP and MJC) scored the GFES at the FEP using a semi-structured interview focused on identifying signs of child vulnerability, adverse experiences, and family interactions. For all the patients, information was gathered through direct interviews with the parents and patient, which were conducted independently, and information from medical and social records. All these information sources were combined to rate the GFES, and in the case of contradictory or suspected unreliable information, as is often the case in highly disrupted families, we tried to contact other family members or significant others to clarify the ratings, which was the case in about 25% of the sample. In the present study, the GFES score system was reversed, with higher scores reflecting more adversity. According to the reversed GFES scoring system, scores of 1–10 indicate no CA exposure, scores of 11–30 indicate mild CA exposure, scores of 31–50 indicate moderate CA exposure, and scores of 51–90 indicate severe CA exposure.

Assessment of outcome domains

At follow-up and after a period of at least 6 months of clinical stability, outcome domains were assessed by field interviewers (EGJ and LM) using information from multiple sources, including direct interviews with the patients. The raters were blinded to the baseline information of the patients, including CA ratings. We assessed six major outcome domains: psychopathology, role functioning, self-rated quality of life, neurological impairment, cognitive performance, and comorbidity.

https://doi.org/10.1017/S0033291724001223 Published online by Cambridge University Press

Psychopathology was rated using the Scale for the Assessment of Positive Symptoms (SAPS) and the Scale for the Assessment of Negative Symptoms (SANS), as included in the CASH, considering the severity of psychopathology over the last month. Role functioning was rated over the last year using the World Health Organization-Disability Assessment Schedule (WHO-DAS) (World Health Organization, 1988). Under the umbrella concept of 'quality of life', participants self-rated questionnaires on general quality of life – the Schizophrenia Quality of Life Scale (SQLS) (Wilkinson et al., 2000), perceived health status – the EuroQol-5D (EQ-5D) (Brooks, 1996), personal recovery – the Questionnaire of Personal Recovery (QPR-15) (Law, Neil, Dunn, & Morrison, 2014), and internalized stigma – Internalized Stigma of Mental Illness (ISMI-9) scale (Hammer & Toland, 2017).

Neurological function was assessed using the Neurological Examination Scale (Buchanan & Heinrichs, 1989). Cognitive performance was assessed using the Screen for Cognitive Impairment in Psychiatry (SCIP) (Purdon, 2005). Due to lack of collaboration, 22 participants did not complete the SCIP and 18 participants did not complete the NES. Furthermore, we assessed social cognition in 165 patients who could cooperate using the Spanish version of the MATRICS Consensus Cognitive Battery (MCCB) (Nuechterlein & Green, 2006).

Lastly, comorbidity included number of metabolic syndrome criteria as assessed by the American Heart Association; National Heart, Lung, and Blood Institute (Grundy et al., 2005), severity of drug abuse as rated with the Addiction Severity Index (ASI) (McLellan et al., 1985), medical comorbidity as rated by the Elixhauser's Medical Comorbidity Index (EMCI) (Elixhauser, Steiner, Harris, & Coffey, 1998), number of lifetime suicide attempts, and number of comorbid DSM-5 non-psychotic mental disorders diagnoses at follow-up. Information to rate comorbidity was obtained using all available information, including personal interviews with the patients and significant others, such as clinical registers.

All these instruments have been validated for Spain, excepting the EMCI and the ISMI-9 scale, which were translated into Spanish by the authors.

Confounding variables

Sociodemographic confounders included sex, age at follow-up, length of follow-up, and parental socioeconomic status (p SES), all assessed with the CASH. Familial load of SSD was assessed in the participants' first-degree relatives using the Family History-Research Diagnostic Criteria (FH-RDC) (Andreasen, Endicott, Spitzer, & Winokur, 1977) and we estimate the familial load score for SSD taking into account family size and age structure (Verdoux et al., 1996). Obstetric complications were assessed using the Lewis and Murray scale (Lewis, Owen, & Murray, 1989). Family history and obstetric complications were documented using information from the patients' parents and clinical registers, and the mother was available in most cases to rate obstetric complications.

Statistics

We first examined the distribution of alternative CA ratings in the whole sample, and compared ratings across DSM-5 diagnoses by using Chi-squared or ANOVA followed by post-hoc tests.

To assess the relationships between CA and the outcomes, we fitted a series of univariate and multivariable linear regression models where each outcome was the dependent variable. Distributions of variables were evaluated for normality and transformed, as appropriate. The basic assumptions of the regression models were checked by examining residual plots, tolerance, and variance inflation factor. Hierarchical regression models were run to determine the independent contribution of CA exposure to predict outcomes. In the first step, we entered the six confounding variables as described above, and in the second step, we entered the childhood adversity score and examined the incremental fit (ΔR^2) over the covariates-only model. Standardized β values were provided to allow comparison between models, while ΔR^2 indexes the unique amount of variance explained by CA exposure in the outcome variance. Recently, Funder & Ozer (2019) recommended that, within the context of assessing the longitudinal impact of a given exposure, the size of R^2 for small, medium, large, and very large effects are 0.01, 0.04, 09, and 0.16, respectively.

We examined the dose–response relationship between levels of childhood adversity (absence, mild, moderate, and severe) and continuous outcome variables by means of ANCOVA, controlling for the covariates and using polynomial contrast coefficients for linear trend testing. Each significant multivariate test was followed up with a post-hoc assessment of the significance between the levels of childhood adversity.

Because we examined the association of childhood adversity ratings with 27 different outcome domains or subdomains, we controlled the type I error rate using the Holm–Bonferroni method, where each outcome domain was considered as a family of hypotheses. All tests were two-tailed and the target α level was set at $p < 0.05$.

Results

Prevalence and severity of CA in the participants

There was no evidence of significant differences in the GFES score, levels of CA exposure, or a dichotomous rating of adversity exposure between participants and non-participants (online Supplementary Table S2).

Visual inspection of GFES scores revealed a semi-normal distribution (online Supplementary Fig.). The mean GFES score was 30.0 (S.D. = 21.8, range: 3–89), and the median score was 22 (interquartile range: 10–45). According to the predefined levels of severity in the GFES, 110 patients (45.3%) were unexposed to CA, 34 (14%) were exposed to mild adversity, 47 (19.3%) were exposed to moderate adversity, and 52 (21.4%) were exposed to severe adversity.

CA experiences were more prevalent and severe in patients with schizophrenia than in those with other psychotic disorders ($p < 0.001$) (Table 1). Levels of childhood adversity also differed significantly across psychotic disorders ($\chi^2 = 58.9$, df = 12, $p < 0.001$) (Fig. 1). CA experiences were more prevalent in patients with schizophrenia (74.3%), followed by those with schizoaffective disorder (53.8%), affective psychoses (32.7%), other psychotic disorders (31.6%), and brief psychotic disorders (25%). Severe CA exposure was highest in schizophrenia (37.2%) and lowest in brief psychotic disorder (no severe exposure).

Associations between confounders and CA

Associations among cofounders are described in online Supplementary Table S3. Descriptive statistics for the confounders

https://doi.org/10.1017/S0033291724001223 Published online by Cambridge University Press

Table 1. Childhood adversity ratings across DSM-5 diagnosis of psychotic disorders

	Schizophrenia (1) *N* = 113	Schizoaffective disorder (2) *N* = 39	Affective psychosis[a] (3) *N* = 52	Brief Psychotic disorder (4) *N* = 20	Other psychotic disorders[b] (5) *N* = 19	$F_{(df=4)}$	*p*	Post-hoc test
GFES score, mean (s.d.)	40.9 (23.6)	24.9 (16.3)	18.6 (13.5)	15.7 (8.96)	21.6 (16.7)	17.9	<0.001	1 > 2,3,4,5
CA exposure, any, *n* (%)	84 (74.3)	21 (53.8)	17 (32.7)	5 (25.0)	6 (31.6)	38.9	<0.001	1 > 2,3,4,5; 2 > 4
Levels of CA exposure[c] mean (s.d.)	1.74 (1.20)	0.94 (1.02)	0.57 (0.95)	0.30 (0.57)	0.73 (1.19)	16.0	<0.001	1 > 2,3,4,5

CA, Childhood Adversity; GFES, Global Family Environment Scale.
[a]Includes 42 patients with bipolar disorder and 10 patients with major depressive disorder.
[b]Includes nine patients with psychotic disorder not otherwise specified, six patients with schizophreniform disorder, and four patients with delusional disorder.
[c]0 = no exposure; 1 = mild exposure; 2 = moderate exposure; 3 = severe exposure

and their univariate associations with continuous and categorical ratings of CA are presented in Table 2. *p* SES, familial load of SSD, and obstetric complications were significantly related to continuous and dichotomic ratings of CA. Obstetric complications were the most contributing factor to CA, since they explained 13.3% and 10.3% of the variability in the continuous and categorical measures of CA, respectively.

Univariate associations between CA and the outcomes

Univariate analyses showed widespread significant associations between the GFES scores and outcomes (Table 3). The GFES score was significantly related to all outcome variables except the EQ-5D score, EMCI score, and number of metabolic syndrome criteria. The variance explained in the outcomes by the GFES score ranged between 2.8% for NES motor coordination and 26.1% for the WHO-DAS total score.

Multivariate associations between CA and the outcomes

After adjusting for confounders, the association pattern between the GFES score and outcomes exhibited smaller effect sizes than that observed in unadjusted analysis; furthermore, the associations of the GFES score with motor coordination and number of suicide attempts were no longer significant after correcting for multiple testing (Table 3). Effect sizes of the associations decreased between 35% and 65% compared to those observed in the univariate analyses. For instance, while ΔR^2 for the association between the GFES score and SCIP total score in the univariate analysis was 0.109, in the multivariate analysis it was 0.040,

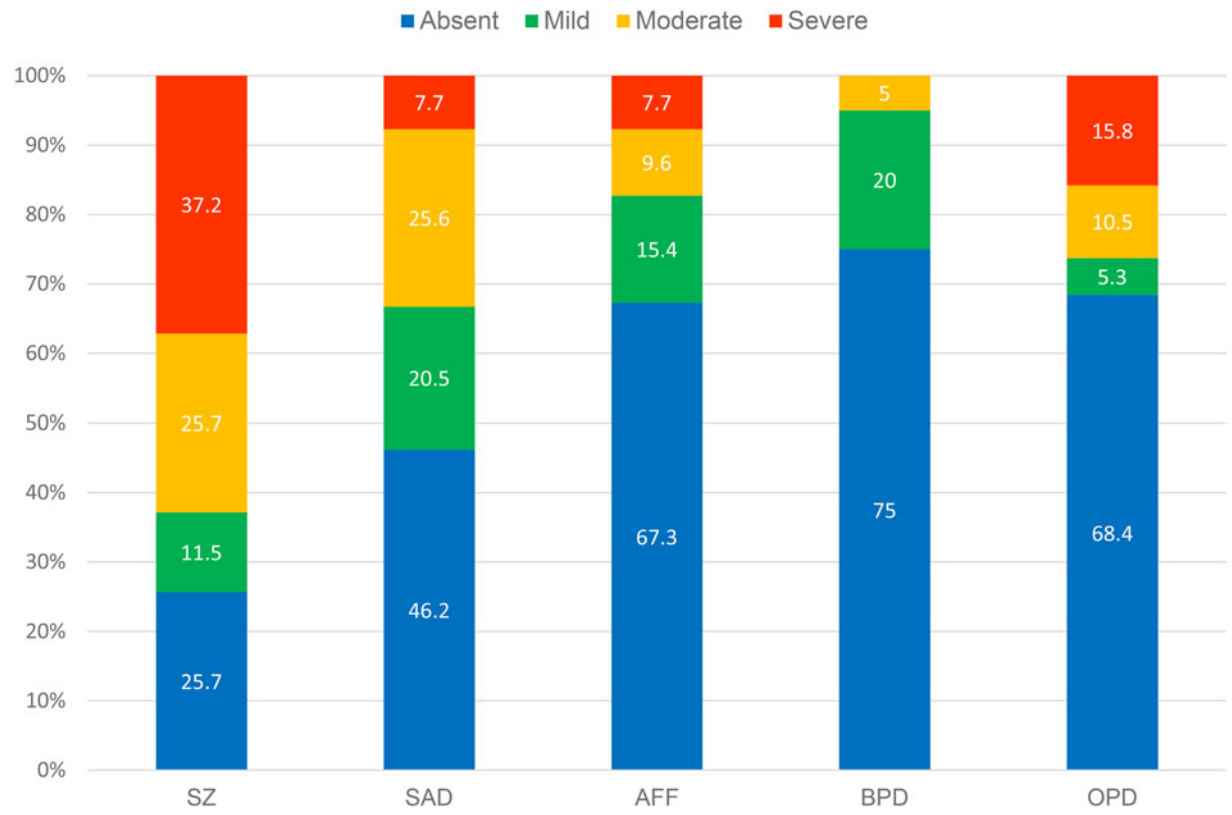

Figure 1. Levels of childhood adversity exposure across diagnoses of psychotic disorders.
Note: SZ, schizophrenia (*N* = 113); SAD, schizoaffective disorder (*N* = 39); AFF, affective psychoses (*N* = 52); BPD, brief psychotic disorder (*N* = 20); OPD, other psychotic disorders (*N* = 19).

https://doi.org/10.1017/S0033291724001223 Published online by Cambridge University Press

Table 2. Associations of confounder variables with continuous and categorical ratings of childhood adversity

	GFES score				No exposure (0) *v.* exposure (1)		
Confounders	Mean (s.d.)	β	p	R^2	OR (95% CI)	p	R^2
Age at follow-up, y.	48.5 (10.4)	−0.048	0.453	0.002	0.99 (0.97–1.02)	0.785	0.001
Sex, female = 0, male = 1	0.56 (0.49)	0.005	0.938	0.000	1.14 (0.68–1.90)	0.600	0.002
Parental socioeconomic status (1–5)	3.07 (0.72)	0.149	0.020	0.022	1.65 (1.14–2.39)	0.008	0.007
Length of follow-up, y.	20.9 (5.52)	0.023	0.723	0.001	0.99 (0.94–1.04)	0.793	0.000
Familial load of schizophrenia spectrum disorders	12.1 (74.0)	0.171	0.008	0.029	1.51 (1.05–2.81	0.025	0.029
Obstetric complications	0.23 (0.53)	0.365	<0.001	0.133	3.84 (1.85–7.84)	<0.001	0.103

GFES, Global Family Environment Score.

which represents a 63.3% decrease. Large to very large effect sizes were observed for most role-functioning variables and negative symptoms (ΔR^2 between 0.105 and 0.181). Moderate effect sizes were observed, in that order, for positive symptoms, personal functioning, social cognition, impaired immediate verbal learning, internalized stigma, personal recovery, and SCIP total score (ΔR^2 between 0.040 and 0.066). All other significant associations had small effect sizes. The highest incremental variance over the covariates-only model was observed for familial functioning (18.1%) and social functioning (17.1%), such as the WHO-DAS total score (17.6%).

Dose–response relationship between levels of CA and the outcomes

Levels of CA exposure exhibited a dose–response association pattern with the outcomes (Table 4). A particularly strong dose–response relationship (p trend $\leqslant 0.001$) was observed for the following outcomes: all role functioning variables, positive and negative symptoms, immediate verbal learning, processing speed, SCIP total score, and NES total score. Other significant dose–response relationships (p trend > 0.001) mainly involved differences between no exposure and severe exposure.

Discussion

Main findings

The study's results can be summarized into five main findings. First, CA experiences were more prevalent and severe in patients with schizophrenia than in those with other psychotic disorders. The overall prevalence of adversity in psychotic disorders was 54.7%, and in schizophrenia it increased to 74.3%. Relatedly, 37.2% of patients with schizophrenia were exposed to severe CA, while it was <16% for other psychotic disorders. Second, p SES, familial load of SSD, and obstetric complications significantly impacted the ratings of adversity and its associations with outcomes, as shown by the finding that the effect sizes of the univariate associations between CA and outcomes decreased substantially when adjusted for these confounders. Third, CA uniquely predicted a wide range of poor outcomes with variable effect sizes, both between and within outcome domains. Overall, CA most impacted role functioning, followed, in that order, by symptoms, cognitive functioning, quality of life, neurological function, and comorbidity. Moderate to very large effect sizes were observed for CA predicting poor role functioning and symptoms, whereas small to moderate effect sizes were observed for the other outcome domains. Fourth, we found evidence of a dose-response relationship between levels of adversity and outcomes, with increasing severity of adversities exposure increasing the risk of poorer outcomes.

These findings add to the literature with evidence suggesting that CA exposure in psychosis patients leads, in a dose–response fashion, to widespread and long-lasting impairment in several outcome domains. Of particular relevance was the impact of CA on role functioning, since 17.6% of the variance in overall functioning was uniquely explained by CA. This is an outstanding finding given the long-time lag (of at least 36 years) between risk exposure and outcome assessment. Notwithstanding this, it should be noted that the variance explained by CA experiences in most outcome subdomains other than role functioning and negative symptoms was very small (i.e. around 5%).

A question that arises is whether our findings are specific to psychosis or whether they represent the non-specific effects of early adversity on a specific illness. Given the evidence of the extensive effects of CA on mental health outcomes irrespective of diagnostic categories (Norman et al., 2012; Teicher, Gordon, & Nemeroff, 2022), we believe that the second possibility is more plausible. Furthermore, given the higher prevalence and severity of CA in people with schizophrenia, most effects on outcomes appear to be mainly due to schizophrenia, a disorder with relevant neurodevelopmental risk factors and mechanisms (Murray, Bhavsar, Tripoli, & Howes, 2017). Children exposed to adversity are still in a sensitive period of neurological, cognitive, social, and emotional development, which helps to explain – via the principle of multifinality (i.e. one risk factor may contribute to various outcomes) the widespread and enduring effects we observed. Indeed, CA appears to lead to neurodevelopmental disruption with substantial effects on brain structure and function, with broad and long-lasting consequences (Teicher, Samson, Anderson, & Ohashi, 2016). The links of CA with self-perceived poor recovery and internalized stigma are also consistent with the social defeat hypothesis stating that early adversity leads to negative experiences of being excluded from the majority group (Selten, van der Ven, Rutten, & Cantor-Graae, 2013).

Comparison with the literature

Comparison with other studies is difficult because of the differences in measures of CA and the lack of very long-term follow-up studies examining outcome domains. Notwithstanding this, some comparisons are in order. Regarding the prevalence of CA, it

https://doi.org/10.1017/S0033291724001223 Published online by Cambridge University Press

Table 3. Severity of childhood adversity (age 0–12 years) predicting outcomes in 243 patients with psychotic disorders

		Unadjusted			Adjusted for confounders		
Outcomes	Mean (S.D.)	β	p	R^2	β	p	ΔR^2
Symptoms:							
SAPS, global ratings summary score	2.86 (3.66)	0.340	**<0.001**	0.115	0.279	**<0.001**	0.066
SANS, global ratings summary score	5.89 (4.96)	0.432	**<0.001**	0.186	0.353	**<0.001**	0.105
Role functioning (WHO-DAS)							
Personal	1.11 (1.40)	0.328	**<0.001**	0.108	0.269	**<0.001**	0.061
Occupational	2.32 (1.87)	0.402	**<0.001**	0.162	0.358	**<0.001**	0.108
Familial	1.24 (1.40)	0.498	**<0.001**	0.248	0.463	**<0.001**	0.181
Social	1.97 (1.61)	0.495	**<0.001**	0.245	0.450	**<0.001**	0.171
Total score	6.64 (5.31)	0.511	**<0.001**	0.261	0.457	**<0.001**	0.176
Self-reported quality of life							
SQLS score	26.8 (21.4)	0.247	**<0.001**	0.061	0.192	**0.005**	0.031
QPR-15 score	43.0 (11.1)	−0.311	**<0.001**	0.097	−0.237	**<0.001**	0.048
EQ-5D score	1.98 (1.98)	0.113	0.078	0.013	0.090	0.187	0.007
ISMI-9 score	11.4 (7.82)	0.331	**<0.001**	0.110	0.253	**<0.001**	0.054
Cognition (SCIP)							
Immediate verbal learning	17.0 (5.39)	−0.349	**<0.001**	0.122	−0.261	**<0.001**	0.059
Delayed verbal learning	4.23 (3.05)	−0.266	**<0.001**	0.071	−0.184	**<0.001**	0.029
Working memory	15.3 (4.80)	−0.261	**<0.001**	0.068	−0.174	**0.004**	0.026
Verbal fluency	15.4 (8.41)	−0.248	**<0.001**	0.061	−0.194	**0.003**	0.032
Processing speed	7.25 (3.47)	−0.268	**<0.001**	0.072	−0.193	**<0.001**	0.032
SCIP total score	59.6 (20.7)	−0.330	**<0.001**	0.109	−0.214	**<0.001**	0.040
Social cognition (MCCB)	45.1 (11.8)	−0.254	**<0.001**	0.064	−0.263	**<0.001**	0.061
Neurological function (NES)							
Sensorial integration	4.20 (2.89)	0.228	**0.001**	0.052	0.182	**0.005**	0.028
Motor coordination	2.39 (2.78)	0.168	**0.012**	0.028	0.125	0.068	0.013
Sequencing motor acts	5.24 (4.00)	0.240	**<0.001**	0.058	0.166	**0.006**	0.023
Total score	19.7 (12.5)	0.259	**<0.001**	0.067	0.194	**0.001**	0.032
Comorbidity:							
No. of comorbid DSM-5 diagnoses	1.08 (1.11)	0.222	**0.001**	0.049	0.150	0.026	0.019
Addiction Severity Index score	1.70 (1.84)	0.175	**0.006**	0.031	0.267	**0.001**	0.054
No. of suicide attempts	1.13 (2.95)	0.182	**0.004**	0.033	0.152	0.027	0.020
Elixhauser Medical Comorbidity Index score	3.04 (2.48)	0.078	0.228	0.006	0.081	0.207	0.006
No. of metabolic syndrome criteria	1.54 (1.41)	0.070	0.280	0.005	0.069	0.309	0.004

EQ-5D, EuroQol-5D; DSM, Diagnostic and Statistical Manual, 5th edition; ISMI, Internalized Stigma Scale; MCCB, MATRICS Consensus Cognitive Battery; NES, Neurological Examination Scale; QPR, Questionnaire of Personal Recovery; SAPS, Scale for the Assessment of Positive Symptoms; SANS, Scale for the Assessment of Negative Symptoms SCIP, Screen for Cognitive Impairment in Psychiatry; SQLS, Schizophrenia Quality of Life Scale; WHO-DAS, World Health Organization-Disability Assessment Schedule.
In bold are presented statistically significant associations after correcting for multiple comparisons.

should be noted that our prevalence rate (54.7%) was similar to the almost 50% prevalence reported in studies of FEP in Spain (Alameda et al., 2015; Arranz et al., 2018; Barrigón et al., 2015). Additionally, we found that 62.9% of patients with schizophrenia experienced moderate to severe adversity, a figure similar to the 56.1% reported by Struck et al. (2020) using the childhood trauma questionnaire. The similar prevalence rates of CA across studies and measures further adds to the validity of the GFES in assessing CA.

Comparison with other studies regarding outcomes is of little value since as noted in the introduction, most previous studies were cross-sectional and, if prospective, the follow-up period was too short and variable to provide insightful comparisons. As a matter of fact, systematic reviews and meta-analyses provide evidence for a link between CA and cognition (Vargas & Mittal, 2018), functioning (Christy et al., 2023), and symptoms (Alameda et al., 2021; Bailey et al., 2018), but with overall small

https://doi.org/10.1017/S0033291724001223 Published online by Cambridge University Press

Table 4. Levels of childhood adversity exposure (age 0–12 years) predicting outcomes in 243 patients with psychotic disorders

	Exposure levels				Test for linear trend		
Outcomes	Absent (0) Mean (SE)	Mild (1) Mean (SE)	Moderate (2) Mean (SE)	Severe (3) Mean (SE)	Estimate	*p*	Post-hoc test
Symptoms:							
SAPS, global ratings summary score	1.97 (0.34)	2.82 (0.59)	4.00 (0.51)	4.12 (0.50)	1.84	**<0.001**	0,1 < 2,3
SANS, global ratings summary score	4.17 (0.41)	6.59 (0.72)	6.91 (0.61)	8.15 (0.60)	2.77	**<0.001**	0 < 1,2,3
Role functioning (WHO-DAS)							
Personal	0.66 0(0.12)	1.42 (0.21)	1.24 (0.18)	1.73 (0.17)	0.67	**<0.001**	0 < 1,2,3
Occupational	1.61 (0.16)	2.56 (0.28)	2.73 (0.24)	3.23 0(0.24)	1.13	**<0.001**	0 < 1,2,3
Familial	0.62 (0.11)	1.22 (0.20)	1.66 0(0.17)	2.20 (0.17)	1.14	**<0.001**	0 < 1,2 < 3
Social	1.17 (0.13)	2.06 0(0.23)	2.66 (0.19)	2.96 (0.19)	1.32	**<0.001**	0 < 1 < 2 < 3
Total score	4.09 (0.42)	7.26 (0.74)	8.28 (0.63)	10.1 (0.62)	4.28	**<0.001**	0 < 1,2 < 3
Self-reported quality of life							
SQLS score	23.8 (2.04)	25.5 (3.57)	28.7 (3.06)	32.9 (3.01)	6.77	**0.014**	0 < 3
QPR-15 score	45.1 (1.03)	42.8 (1.82)	42.0 (1.55)	39.3 (1.53)	−4.10	**0.004**	0 < 3
EQ-5D score	1.75 (0.18)	2.39 (0.33)	1.96 (2.84)	2.25 (0.27)	0.21	0.407	–
ISMI-9 score	9.56 (0.72)	11.3 (1.26)	12.0 (1.08)	14.2 (1.06)	3.04	**0.002**	0 < 3
Cognition (SCIP)							
Immediate verbal learning	18.4 (0.44)	17.1 (0.83)	16.0 (0.67)	14.5 (0.69)	−2.85	**<0.001**	0 > 2,3; 1 > 3
Delayed verbal learning	4.79 (0.25)	3.83 (0.48)	4.10 (0.39)	3.25 (0.40)	−0.96	**0.008**	0 > 3
Working memory	16.3 (0.39)	15.0 (0.75)	14.1 (0.60)	14.2 (0.62)	−1.47	**0.008**	0 > 2,3
Verbal fluency	16.9 (0.76)	15.5 (1.43)	14.6 (1.16)	12.1 (1.20)	−3.41	**0.002**	0 > 3
Processing speed	8.12 (0.26)	6.58 (0.51)	6.63 (0.40)	6.15 (0.43)	−1.25	**0.001**	0 > 1,2,3
SCIP total score	64.9 (1.62)	59.1 (3.10)	55.7 (2.50)	50.9 (2.61)	−9.93	**<0.001**	0 > 2,3
Social cognition (MATRICS)	47.2 (1.31)	46.7 (2.65)	43.2 (2.07)	40.0 (2.25)	−5.67	**0.004**	0 > 3
Neurological function (NES)							
Sensorial integration	3.63 (0.25)	4.25 (0.48)	4.38 (0.38)	5.32 (0.40)	1.51	**0.002**	0 < 3
Motor coordination	1.81 (0.26)	2.72 (0.49)	2.93 (0.40)	2.94 (0.41)	0.79	0.033	0 < 2,3
Sequencing motor acts	4.34 (0.34)	5.57 (0.63)	6.64 (0.51)	5.74 (0.53)	1.18	**0.010***	0 < 2,3
Total score	16.3 (1.06)	20.6 (1.99)	23.6 (1.61)	23.1 (1.67)	5.26	**<0.001**	0 < 1,2,3
Comorbidity:							
No. comorbid DSM-5 diagnoses	0.55 (0.09)	0.67 (0.15)	0.92 (0.13)	1.04 (0.13)	3.84	**0.002**	0 < 2,3
Addiction Severity Index score	1.38 (0.18)	1.30 (0.32)	1.70 (0.28)	2.64 (0.28)	0.78	**0.001**	0,1,2 < 3
No. of suicide attempts	0.68 (0.28)	1.02 (0.50)	1.39 (0.43)	1.91 (0.42)	0.92	0.019	0 < 3
Elixhauser Medical Comorbidity Index score	2.86 (0.22)	3.12 (0.39)	3.00 (0.34)	3.42 (0.33)	0.34	0.262	–
No. of metabolic syndrome criteria	1.44 (0.13)	1.51 (0.23)	1.58 (0.20)	1.72 (0.20)	0.20	0.270	–

See Table 3 for abbreviations.
In bold are presented statistically significant associations after correcting for multiple comparisons.
* Also fit a quadratic function ($p = 0.024$).

effect sizes and mixed evidence for subdomains thereof. In line with the literature (McKay et al., 2022), we found evidence of CA predicting psychiatric comorbidity, such as number of comorbid diagnoses, drug abuse, and suicidality. However, contrary to expectations, we found that CA did not predict medical comorbidity or metabolic syndrome features. We are not aware of previous studies prospectively addressing this question in psychotic disorders, although in line with our findings, a systematic review of 20 cross-sectional studies did not find an association between CA and metabolic syndrome in participants with severe mental illness (Balaji & Sankaranarayanan, 2023). There is a lack of studies examining the long-term effects of CA on quality-of-life

https://doi.org/10.1017/S0033291724001223 Published online by Cambridge University Press

measures and neurological dysfunction, thus our findings regarding these outcomes need to be confirmed by other authors.

Measurement issues

Single-item measures of psychological experiences are often viewed as being psychometrically suspected. To quantify childhood adversity, we used the GFES, which consists of a single-score measure that retrospectively rates CA within the family. Thus, the GFES has important limitations derived from (1) using a single global rating of CA, (2) excluding adversities outside the family context, (3) lack of rating of specific adversities, and (4) the retrospective assessment of childhood events. Indeed, the GFES has been criticized for being a global measure and having the potential cost of losing specificity because adversities that influence one sort of outcome may not necessarily be the same as those that affect others (Rutter, 1997). A further limitation of the GFES is that it has been rarely used in research, which limits comparison with other studies.

That said, it is important to note that the GFES is a reliable and valid retrospective measure indexing cumulative psychosocial adversities of the child (Rey et al., 1997). Moreover, the GFES has several advantages over most other CA scales. First, it includes rearing practices, such as parental conflicts and inconsistencies about discipline or expectations (i.e. child's overprotection), which may negatively impact psychological development, and are rarely considered in other rating scales. Second, because adversities tend to cluster together, the scale accounts for their interactive effects on the global score. Third, the GFES does not merely rate adversity experiences, but also an adequate and nurturing family environment for the child, which can buffer the effect of adversities outside the family (Garner & Yogman, 2021). Lastly, the GFES assesses early adversities (under age 12), which conveys higher power to predict poor outcomes than late adversities (Alameda et al., 2015).

While many researchers of childhood adversity strongly advocate the use of multi-item scales, several authors have recently challenged this idea by signifying that single-item measures can have acceptable psychometric properties and are a potentially viable alternative to multi-item scales for construct measurement purposes (Allen, Iliescu, & Greiff, 2022; Vargas & Mittal, 2018). As a matter of fact, experiences of childhood adversity are highly interrelated (Dong et al., 2004) and compiling a single additive cumulative 'risk' score can increase the power of the design (Evans, Li, & Whipple, 2013), so it makes sense to use a global measure of adversity.

Implications

Our findings suggest that interventions aimed at reducing exposure to CA are important for reducing adult morbidity of psychotic disorders. Most articles on this topic typically conclude with a call for increased funding for public health and policy interventions, with a broader perspective on health that extends beyond the medical system. However, primary prevention has proven difficult and will ultimately require societal changes that improve the quality of family and household environments during childhood. A review of programs for young children and families facing adversity concluded that there was mixed evidence on their effectiveness, and that more effective interventions are particularly needed in the prenatal period and first three years after birth for the most disadvantaged children and families (Shonkoff, 2016). Secondary prevention of the effects of CA will first require increased recognition of their occurrence and, second, an effective understanding of both personal and familial resilience abilities to cope with these experiences. Lastly, tertiary prevention in the case of psychosis will require routine clinical inquiry into CA experiences within FEP programs. This has potentially important treatment implications for identifying individuals at elevated risk of poor outcomes. While there is currently no clear guidance on how to target childhood trauma in the early treatment of psychosis, there are several promising lines of inquiry, including desensitization and reprocessing therapy and trauma-focused cognitive-behavioral therapy (Hardy et al., 2024).

Strengths and limitations

We used a representative sample of patients with first-admission psychosis, who were assessed for CA at FEP and re-assessed after a mean of 21 years of follow-up for 27 outcome domains and subdomains. By adjusting for relevant confounders, we showed that CA experiences had unique and widespread impact across outcomes with variable effect sizes. We additionally found that the identified effects had a dose–response relationship, and that CA exposure was more prevalent and severe in schizophrenia than in other psychotic disorders. This allowed the demonstration of a temporal relationship between CA exposure and outcomes lending confidence to causal inference.

The specific limitations of using the GFES to assess CA have already been discussed; however, some other limitations of our study should be noted. First, loss to follow-up is inevitable over a 21-year period, and we had a 46.4% attrition rate of living subjects. Nevertheless, previous research simulating the effects of selective dropout in longitudinal studies found that it may not reduce the validity of predicting outcomes (Wolke et al., 2009), and we did not find evidence of selection bias regarding baseline variables, including rates and severity of CA. Second, we relied on retrospective reports of CA, which are subject to mis-reporting due to recall bias. More specifically, CA experiences were ascertained during the FEP, where might be a reporting bias for more severe presentations. Nevertheless, evidence suggests that retrospective reports have moderate-to-good consistency over time, and may be a reliable and valid indicator of early life adversities, thus having a worthwhile place in research (Hardt & Rutter, 2004), particularly when assessed using multi-information sources (Vargas & Mittal, 2018). We used a semi-structured interview to retrospectively rate CA using multiple information sources, which minimizes recall bias and provides additional important contextual details of adversity exposure (Gayer-Anderson et al., 2020). Finally, it is possible that different types of CA impact the outcomes differently. In this sense, our study can be viewed as a general approach to this issue that should be further examined using more specific measures of CA, as well as timing and duration of adversity.

Acknowledgement. We are extremely grateful to all subjects who took part in this study.

Funding statement. The study was funded by the Spanish Ministry of Economy, Industry and Competitiveness (grant PI16/02148 and 19/01698) and the Regional Government of Navarra (grant 31/17 and 41/18).

Competing interest. The authors declare no conflicts of interest

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S0033291724001223

*SEGPEPs group: A. Ballesteros[a], L. Fañanás[b,c], G. Gil-Berrozpe[d,e], R. Hernández[f], R. Lorente[d], S. Papiol[g,h], M. Ribeiro[d,e], A. Rosero[i] and M. Zandio[d,e]

[a]Red de Salud Mental de Álava, Vitoria-Gasteiz, Spain; [b]Department of Evolutionary Biology, Ecology and Environmental Sciences, Faculty of Biology, University of Barcelona, Biomedicine Institute of the University of Barcelona (IBUB),

https://doi.org/10.1017/S0033291724001223 Published online by Cambridge University Press

Barcelona, Spain; [c]Network Centre for Biomedical Research in Mental Health (CIBER of Mental Health, CIBERSAM), Spain; [d]Instituto de Investigación Sanitaria de Navarra (IdiSNA), Pamplona, Spain; [e]Department of Psychiatry, Complejo Hospitalario de Navarra, Pamplona, Spain; [f]CSMIJ Ciutat Vella. Consorci Parc de Salut Mar, Barcelona, Spain; [g]Institute of Psychiatric Phenomics and Genomics (IPPG), University Hospital, LMU Munich, Munich, 80336, Germany; [h]Department of Psychiatry and Psychotherapy, University Hospital, LMU Munich, Munich, 80336, Germany and [i]Mental Health Department, Servicio Navarro de Salud, Pamplona, Spain

References

Ajnakina, O., Trotta, A., Forti, M. D., Stilo, S. A., Kolliakou, A., Gardner-Sood, P., … Fisher, H. L. (2018). Different types of childhood adversity and 5-year outcomes in a longitudinal cohort of first-episode psychosis patients. *Psychiatry Research*, *269*, 199–206. https://doi.org/10.1016/j.psychres.2018.08.054

Alameda, L., Christy, A., Rodriguez, V., Salazar de Pablo, G., Thrush, M., Shen, Y., … Murray, R. M. (2021). Association between specific childhood adversities and symptom dimensions in people with psychosis: Systematic review and meta-analysis. *Schizophrenia Bulletin*, *47*(4), 975–985. https://doi.org/10.1093/schbul/sbaa199

Alameda, L., Ferrari, C., Baumann, P. S., Gholam-Rezaee, M., Do, K. Q., & Conus, P. (2015). Childhood sexual and physical abuse: Age at exposure modulates impact on functional outcome in early psychosis patients. *Psychological Medicine*, *45*(13), 2727–2736. https://doi.org/10.1017/S0033291715000690

Allen, M. S., Iliescu, D., & Greiff, S. (2022). Single item measures in psychological science. *European Journal of Psychological Assessment*, *38*(1), 1–5. https://doi.org/10.1027/1015-5759/a000699

Andreasen, N. C. (1987). *The comprehensive assessment of symptoms and history* (*CASH*). Iowa: University of Iowa.

Andreasen, N. C. (1992). The Comprehensive Assessment of Symptoms and History (CASH): An instrument for assessing diagnosis and psychopathology. *Archives of General Psychiatry*, *49*(8), 615. https://doi.org/10.1001/archpsyc.1992.01820080023004

Andreasen, N. C., Endicott, J., Spitzer, R. L., & Winokur, G. (1977). The family history method using diagnostic criteria. Reliability and validity. *Archives of General Psychiatry*, *34*(10), 1229–1235.

Arranz, S., Monferrer, N., Jose Algora, M., Cabezas, A., Sole, M., Vilella, E., … Sanchez-Gistau, V. (2018). The relationship between the level of exposure to stress factors and cannabis in recent onset psychosis. *Schizophrenia Research*, *201*, 352–359. https://doi.org/10.1016/j.schres.2018.04.040

Bailey, T., Alvarez-Jimenez, M., Garcia-Sanchez, A. M., Hulbert, C., Barlow, E., & Bendall, S. (2018). Childhood trauma is associated with severity of hallucinations and delusions in psychotic disorders: A systematic review and meta-analysis. *Schizophrenia Bulletin*, *44*(5), 1111–1122. https://doi.org/10.1093/schbul/sbx161

Balaji, S., & Sankaranarayanan, A. (2023). The association between adverse childhood experiences and metabolic syndrome in severe mental illness: A literature review. *Australasian Psychiatry: Bulletin of Royal Australian and New Zealand College of Psychiatrists*, *31*(3), 381–388. https://doi.org/10.1177/10398562231167782

Barrigón, M. L., Diaz, F. J., Gurpegui, M., Ferrin, M., Salcedo, M. D., Moreno-Granados, J., … Ruiz-Veguilla, M. (2015). Childhood trauma as a risk factor for psychosis: A sib-pair study. *Journal of Psychiatric Research*, *70*, 130–136. https://doi.org/10.1016/j.jpsychires.2015.08.017

Brooks, R. (1996). EuroQol: The current state of play. *Health Policy* (*Amsterdam, Netherlands*), *37*(1), 53–72. https://doi.org/10.1016/0168-8510(96)00822-6

Buchanan, R. W., & Heinrichs, D. W. (1989). The Neurological Evaluation Scale (NES): A structured instrument for the assessment of neurological signs in schizophrenia. *Psychiatry Research*, *27*(3), 335–350.

Christy, A., Cavero, D., Navajeeva, S., Murray-O'Shea, R., Rodriguez, V., Aas, M., … Alameda, L. (2023). Association between childhood adversity and functional outcomes in people with psychosis: A meta-analysis. *Schizophrenia Bulletin*, *49*(2), 285–296. https://doi.org/10.1093/schbul/sbac105

Cotter, J., Kaess, M., & Yung, A. R. (2015). Childhood trauma and functional disability in psychosis, bipolar disorder and borderline personality disorder: A review of the literature. *Irish Journal of Psychological Medicine*, *32*(1), 21–30. https://doi.org/10.1017/ipm.2014.74

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

Dragioti, E., Radua, J., Solmi, M., Arango, C., Oliver, D., Cortese, S., … Fusar-Poli, P. (2022). Global population attributable fraction of potentially modifiable risk factors for mental disorders: A meta-umbrella systematic review. *Molecular Psychiatry*, *27*(8), 3510–3519. https://doi.org/10.1038/s41380-022-01586-8

Du Rocher Schudlich, T., Youngstrom, E. A., Martinez, M., KogosYoungstrom, J., Scovil, K., Ross, J., … Findling, R. L. (2015). Physical and sexual abuse and early-onset bipolar disorder in youths receiving outpatient services: Frequent, but not specific. *Journal of Abnormal Child Psychology*, *43*(3), 453–463. https://doi.org/10.1007/s10802-014-9924-3

Elixhauser, A., Steiner, C., Harris, D. R., & Coffey, R. M. (1998). Comorbidity measures for use with administrative data. *Medical Care*, *36*(1), 8–27. https://doi.org/10.1097/00005650-199801000-00004

Evans, G. W., Li, D., & Whipple, S. S. (2013). Cumulative risk and child development. *Psychological Bulletin*, *139*(6), 1342–1396. https://doi.org/10.1037/a0031808

Fares-Otero, N. E., Alameda, L., Pfaltz, M. C., Martinez-Aran, A., Schäfer, I., & Vieta, E. (2023). Examining associations, moderators and mediators between childhood maltreatment, social functioning, and social cognition in psychotic disorders: A systematic review and meta-analysis. *Psychological Medicine*, *53*(13), 5909–5932. https://doi.org/10.1017/S0033291723001678

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

Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science*, *2*(2), 156–168. https://doi.org/10.1177/2515245919847202

Garner, A., Yogman, M., & Committee on Psychosocial Aspects of Child and Family Health, Section on Developmental and Behavioral Pediatrics, Council on Early Childhood. (2021). Preventing childhood toxic stress: Partnering with families and communities to promote relational health. *Pediatrics*, *148*(2), e2021052582. https://doi.org/10.1542/peds.2021-052582

Gayer-Anderson, C., Reininghaus, U., Paetzold, I., Hubbard, K., Beards, S., Mondelli, V., … Morgan, C. (2020). A comparison between self-report and interviewer-rated retrospective reports of childhood abuse among individuals with first-episode psychosis and population-based controls. *Journal of Psychiatric Research*, *123*, 145–150. https://doi.org/10.1016/j.jpsychires.2020.02.002

Grundy, S. M., Cleeman, J. I., Daniels, S. R., Donato, K. A., Eckel, R. H., Franklin, B. A., … Costa, F. (2005). Diagnosis and management of the metabolic syndrome: An American Heart Association/National Heart, Lung, and Blood Institute Scientific Statement. *Circulation*, *112*(17), 2735–2752. https://doi.org/10.1161/circulationaha.105.169404

Hammer, J. H., & Toland, M. D. (2017). Internal structure and reliability of the Internalized Stigma of Mental Illness Scale (ISMI-29) and Brief Versions (ISMI-10, ISMI-9) among Americans with depression. *Stigma and Health*, *2*(3), 159–174. https://doi.org/10.1037/sah0000049

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

Hardy, A., Keen, N., van den Berg, D., Varese, F., Longden, E., Ward, T., … Brand, R. M. (2024). Trauma therapies for psychosis: A state-of-the-art review. *Psychology and Psychotherapy*, *97*(1), 74-90. https://doi.org/10.1111/papt.12499

https://doi.org/10.1017/S0033291724001223 Published online by Cambridge University Press

Hawes, D. J., Lechowicz, M., Roach, A., Fisher, C., Doyle, F. L., Noble, S., & Dadds, M. R. (2021). Capturing the developmental timing of adverse childhood experiences: The adverse life experiences scale. *American Psychologist*, *76*(2), 253–267. https://doi.org/10.1037/amp0000760

Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., … Williams, D. R. (2010). Childhood adversities and adult psychopathology in the WHO world mental health surveys. *The British Journal of Psychiatry: The Journal of Mental Science*, *197*(5), 378–385. https://doi.org/10.1192/bjp.bp.110.080499

Law, H., Neil, S. T., Dunn, G., & Morrison, A. P. (2014). Psychometric properties of the questionnaire about the process of recovery (QPR). *Schizophrenia Research*, *156*(2–3), 184–189. https://doi.org/10.1016/j.schres.2014.04.011

Leeb, R., Paulozzi, L., Melanson, C., Simon, T., & Arias, I. (2008). *Child maltreatment surveillance: Uniform definitions for public health and recommended data elements*. Atlanta: Centers for Disease Control and Prevention. Recuperado de Centers for Disease Control and Prevention website: https://www.ncbi.nlm.nih.gov/nlmcatalog?cmd=PureSearch&term=101521605%5Bnlmid%5D

Lewis, S. W., Owen, R. M., & Murray, R. M. (1989). Obstetric complications and schizophrenia. In S. C. Schulz & C. A. Tamminga (Eds.), *Schizophrenia: Scientific progress* (pp. 56–68). New York: Oxford University Press.

Marques-Feixa, L., Palma-Gudiel, H., Romero, S., Moya-Higueras, J., Rapado-Castro, M., & Castro-Quintas, Á., … EPI-Young Stress GROUP. (2023). Childhood maltreatment disrupts HPA-axis activity under basal and stress conditions in a dose-response relationship in children and adolescents. *Psychological Medicine*, *53*(3), 1060–1073. https://doi.org/10.1017/S003329172100249X

McKay, M. T., Kilmartin, L., Meagher, A., Cannon, M., Healy, C., & Clarke, M. C. (2022). A revised and extended systematic review and meta-analysis of the relationship between childhood adversity and adult psychiatric disorder. *Journal of Psychiatric Research*, *156*, 268–283. https://doi.org/10.1016/j.jpsychires.2022.10.015

McLellan, A. T., Luborsky, L., Cacciola, J., Griffith, J., Evans, F., Barr, H. L., & O'Brien, C. P. (1985). New data from the addiction severity index. Reliability and validity in three centers. *Journal of Nervous and Mental Disease*, *173*(7), 412–423. https://doi.org/10.1097/00005053-198507000-00005

Murray, R. M., Bhavsar, V., Tripoli, G., & Howes, O. (2017). 30 Years on: How the neurodevelopmental hypothesis of schizophrenia morphed into the developmental risk factor model of psychosis. *Schizophrenia Bulletin*, *43*(6), 1190–1196. https://doi.org/10.1093/schbul/sbx121

Norman, R. E., Byambaa, M., De, R., Butchart, A., Scott, J., & Vos, T. (2012). The long-term health consequences of child physical abuse, emotional abuse, and neglect: A systematic review and meta-analysis. *PLoS Medicine*, *9*(11), e1001349. https://doi.org/10.1371/journal.pmed.1001349

Nuechterlein, K. H., & Green, M. F. (2006). *MCCB: Matrics consensus cognitive batery*. Los Angeles: MATRICS Assessment.

Peralta, V., de Jalón, E. G., Moreno-Izco, L., Peralta, D., Janda, L., Sánchez-Torres, A. M., … SEGPEPs group. (2023). A clinical staging model of psychotic disorders based on a long-term follow-up of first-admission psychosis: A validation study. *Psychiatry Research*, *322*, 115109. https://doi.org/10.1016/j.psychres.2023.115109

Peralta, V., García de Jalón, E., Moreno-Izco, L., Peralta, D., Janda, L., Sánchez-Torres, A. M., & Cuesta, M. J. (2022). Long-Term outcomes of first-admission psychosis: A naturalistic 21-year follow-Up study of symptomatic, functional and personal recovery and their baseline predictors. *Schizophrenia Bulletin*, *48*(3), 631–642. https://doi.org/10.1093/schbul/sbab145

Peralta, V., Moreno-Izco, L., Garcia de Jalon, E., Sanchez-Torres, A. M., Janda, L., Peralta, D., … SEGPEPs Group. (2021). Prospective long-term cohort study of subjects with first-episode psychosis examining eight major outcome domains and their predictors: Study protocol. *Frontiers in Psychiatry*, *12*, 643112. https://doi.org/10.3389/fpsyt.2021.643112

Purdon, S. E. (2005). *The screen for cognitive impairment in psychiatry (SCIP): Instructions and three alternate forms*. Edmonton, AB: PNL.

Rey, J., Peng, R., Morales-Blanquez, C., Widyawati, I., Peralta, V., & Walter, G. (2000). Rating the quality of the family environment in different cultures. *Journal of the American Academy of Child and Adolescent Psychiatry*, *39*, 1168–1174. https://doi.org/10.1097/00004583-200009000-00017

Rey, J. M., Singh, M., Hung, S. F., Dossetor, D. R., Newman, L., Plapp, J. M., & Bird, K. D. (1997). A global scale to measure the quality of the family environment. *Archives of General Psychiatry*, *54*(9), 817–822. https://doi.org/10.1001/archpsyc.1997.01830210061006

Rodriguez, V., Aas, M., Vorontsova, N., Trotta, G., Gadelrab, R., Rooprai, N. K., & Alameda, L. (2021). Exploring the interplay between adversity, neurocognition, social cognition, and functional outcome in people with psychosis: A narrative review. *Frontiers in Psychiatry*, *12*, 596949. https://doi.org/10.3389/fpsyt.2021.596949

Rutter, M. (1997). Child psychiatric disorder. Measures, causal mechanisms, and interventions. *Archives of General Psychiatry*, *54*(9), 785–789. https://doi.org/10.1001/archpsyc.1997.01830210021002

Selten, J.-P., van der Ven, E., Rutten, B. P. F., & Cantor-Graae, E. (2013). The social defeat hypothesis of schizophrenia: An update. *Schizophrenia Bulletin*, *39*(6), 1180–1186. https://doi.org/10.1093/schbul/sbt134

Shonkoff, J. P. (2016). Capitalizing on advances in science to reduce the health consequences of early childhood adversity. *JAMA Pediatrics*, *170*(10), 1003–1007. https://doi.org/10.1001/jamapediatrics.2016.1559

Struck, N., Krug, A., Yuksel, D., Stein, F., Schmitt, S., Meller, T., … Brakemeier, E.-L. (2020). Childhood maltreatment and adult mental disorders – The prevalence of different types of maltreatment and associations with age of onset and severity of symptoms. *Psychiatry Research*, *293*, 113398. https://doi.org/10.1016/j.psychres.2020.113398

Teicher, M. H., Gordon, J. B., & Nemeroff, C. B. (2022). Recognizing the importance of childhood maltreatment as a critical factor in psychiatric diagnoses, treatment, research, prevention, and education. *Molecular Psychiatry*, *27*(3), 1331–1338. https://doi.org/10.1038/s41380-021-01367-9

Teicher, M. H., Samson, J. A., Anderson, C. M., & Ohashi, K. (2016). The effects of childhood maltreatment on brain structure, function and connectivity. *Nature Reviews. Neuroscience*, *17*(10), 652–666. https://doi.org/10.1038/nrn.2016.111

Trotta, A., Murray, R. M., David, A. S., Kolliakou, A., O'Connor, J., Di Forti, M., … Fisher, H. L. (2016). Impact of different childhood adversities on 1-year outcomes of psychotic disorder in the genetics and psychosis study. *Schizophrenia Bulletin*, *42*(2), 464–475. https://doi.org/10.1093/schbul/sbv131

Vargas, T., & Mittal, V. (2018). Issues affecting reliable and valid assessment of early life stressors in psychosis. *Schizophrenia Research*, *192*, 465–466. https://doi.org/10.1016/j.schres.2017.04.021

Verdoux, H., van Os, J., Sham, P., Jones, P., Gilvarry, K., & Murray, R. (1996). Does familiality predispose to both emergence and persistence of psychosis? A follow-up study. *British Journal of Psychiatry*, *168*(5), 620–626.

Vila-Badia, R., Del Cacho, N., Butjosa, A., Serra Arumí, C., Esteban Santjusto, M., Abella, M., … Usall, J. (2022). Prevalence and types of childhood trauma in first episode psychosis patients. Relation with clinical onset variables. *Journal of Psychiatric Research*, *146*, 102–108. https://doi.org/10.1016/j.jpsychires.2021.12.033

Wilkinson, G., Hesdon, B., Wild, D., Cookson, R., Farina, C., Sharma, V., … Jenkinson, C. (2000). Self-report quality of life measure for people with schizophrenia: The SQLS. *British Journal of Psychiatry*, *177*, 42–46. https://doi.org/10.1192/bjp.177.1.42

Wolke, D., Waylen, A., Samara, M., Steer, C., Goodman, R., Ford, T., & Lamberts, K. (2009). Selective drop-out in longitudinal studies and non-biased prediction of behaviour disorders. *The British Journal of Psychiatry: The Journal of Mental Science*, *195*(3), 249–256. https://doi.org/10.1192/bjp.bp.108.053751

World Health Organization (1988). *WHO Psychiatric disability assessment schedule*. Geneva: World Health Organization.

https://doi.org/10.1017/S0033291724001223 Published online by Cambridge University Press