Published in final edited form as:
Psychol Med. 2011 January ; 41(1): 85–96. doi:10.1017/S0033291710000450.

The prevalence of family childhood adversities and their association with first onset of DSM-IV disorders in metropolitan China

S. Lee[1,2], **W. J. Guo**[2,*], **A. Tsang**[2], **Y. L. He**[3], **Y. Q. Huang**[4], **M. Y. Zhang**[3], **Z. R. Liu**[4], **Y. C. Shen**[4], and **R. C. Kessler**[5]

[1]Department of Psychiatry, The Chinese University of Hong Kong, HKSAR, P. R. China

[2]Hong Kong Mood Disorders Center, The Chinese University of Hong Kong, HKSAR, P. R. China

[3]Shanghai Mental Health Center, P. R. China

[4]Institute of Mental Health, Peking University, P. R. China

[5]Department of Health Care Policy, Harvard Medical School, MA, USA

Abstract

Background—The prevalence of family childhood adversities (FCAs) and their joint effects on the first onset of subsequent mental disorders throughout the life course are rarely examined, especially in Asian communities.

Method—Face-to-face household interviews of 5201 people aged 18–70 years in Beijing and Shanghai were conducted by a multi-stage household probability sampling method. The first onsets of four broad groups of mental disorders and six categories of FCAs were assessed using The World Mental Health Composite International Diagnostic Interview (WMH-CIDI). Joint effects of FCAs were analyzed by the best fitting of several competitive multivariate models.

Results—FCAs were highly prevalent and inter-correlated. Half of them were in a family-dysfunction cluster. The best-fitting model included each of six types of FCA (with family-dysfunction FCAs being the strongest predictors), number of family-dysfunction FCAs, and number of other FCAs. Family-dysfunction FCAs had a significant subadditive association with subsequent disorders. Little specificity was found for the effects of particular FCAs with particular disorders. Predictive effects of FCAs reached the highest in ages 13–24 compared to ages 4–12 and ⩾25. Estimates of population-attributable risk proportions indicated that all FCAs together explained 38.5% of all first-onset disorders.

Conclusions—Chinese children were exposed to a broad spectrum of inter-related FCAs, as found in Western countries. FCAs related to family dysfunction were especially associated with subsequent mental disorders. Biological and/or environmental factors that mediate these long-term effects should be studied in prospective research on broad groups of FCAs.

*Address for correspondence: Dr W. J. Guo, Hong Kong Mood Disorders Center, 7A, Block E, Staff Quarters, Prince of Wales Hospital, Shatin, N.T., Hong Kong, P. R. China. (guowjcn@163.com).

Declaration of Interest

R. C. Kessler has been a consultant for Glaxo-SmithKline Inc., Kaiser Permanente, Pfizer Inc., Sanofi-Aventis, Shire Pharmaceuticals, and Wyeth-Ayerst; has served on advisory boards for Eli Lilly and Company and Wyeth-Ayerst; and has had research support for his epidemiological studies from Bristol-Myers Squibb, Eli Lilly and Company, GlaxoSmithKline, Johnson & Johnson Pharmaceuticals, Ortho-McNeil Pharmaceuticals Inc., Pfizer Inc. and Sanofi-Aventis.

Keywords

Childhood adversity (CA); China; family; first onset; mental disorders

Introduction

Early studies of the effects of childhood adversities (CAs) on long-term mental health focused on a single CA, such as parental death, sexual abuse or neglect (Fristad *et al*. 1993; Fergusson *et al*. 1996; Wark *et al*. 2003), and one mental disorder, usually depression (Brown *et al*. 1987; Comijs *et al*. 2007). Subsequent studies revealed that CAs are frequently concurrent (Ney *et al*. 1994; Dong *et al*. 2004) and exert non-specific effects across multiple outcomes (Kessler *et al*. 1997; Arata *et al*. 2007; Collishaw *et al*. 2007; McLaughlin *et al*. 2009). To avoid overestimating the effects of particular CAs (Mullen *et al*. 1996; Kessler *et al*. 1997; Finkelhor *et al*. 2007), retrospective investigations of the joint effects of multiple CAs documented dose–response relationships between the number of CAs and adult mental problems (Dube *et al*. 2001; Edwards *et al*. 2003; Dong *et al*. 2005). However, the assumption in such studies that CAs had equivalent and additive effects has been challenged (Kessler *et al*. 1994, 1997; Schilling *et al*. 2008). Moreover, the effects of CAs might attenuate with the age of individuals who had them before (Dube *et al*. 2006; Schilling *et al*. 2008). These findings call for the prospective longitudinal study of a variety of CAs in children, but such a research design is limited by cost and attrition of subjects.

Although the establishment of the People's Republic of China had witnessed many devastating sociopolitical upheavals that almost certainly affected family life and individual development, CA and psychic trauma such as sexual abuse and neglect are relatively new professional concepts in China. Many CAs previously represented a taboo subject in China, and there is a common belief that strong family values protected Chinese individuals against CAs and adult psychopathology (Chen *et al*. 1993). Studies on CAs in China only appeared in the late 1990s. Although greater cultural tolerance of childhood maltreatment and stigma about reporting of CAs could hamper such studies (Chen *et al*. 2004; Qiao & Chan, 2005), their findings suggested that CAs were common and negatively associated with mental health status. These studies drew on school or clinical samples and often focused on only childhood abuse (Kim *et al*. 2000; Chen *et al*. 2004, 2008; Chen, 2005; Sun *et al*. 2005; Zhu *et al*. 2006*a*, *b*; Cao *et al*. 2007; Xu *et al*. 2007). They usually used rating scales to measure psychopathology without examining specific disorders (Zhu *et al*. 2006*a*, *b*; Chang & Wang, 2008; Luo *et al*. 2008; Xie *et al*. 2008; Wong *et al*. 2009). The Chinese World Mental Health (WMH) survey in Beijing and Shanghai included measures of six categories of family CAs (FCAs) and a spectrum of 15 mental disorders. Using several competitive multivariate statistical models, the present study aimed to examine the separate and joint effects of a variety of FCAs on the first onset of mental disorders in a Chinese population.

Method

Training and assessment of interviewers, sampling, field procedure and quality control of this study were undertaken according to the standardized procedures of the surveys conducted by all participants of the World Mental Health (WMH) Survey Initiative (www.hcp.med.harvard.edu/wmh/; Kessler *et al*. 2004; Shen *et al*. 2006; Lee *et al*. 2007; Heeringa *et al*. 2008; Pennell *et al*. 2008).

Sample

The survey was based on a multi-stage clustered area probability sample of household-dwelling adults aged 18–70 years in the metropolitan areas of Beijing (*n*=2633) and

Shanghai (*n*=2568). The demographic distribution of the sample was weighted with census data (male: 52.6%, female: 47.3%; age 18–29 years: 27.3%, 30–39: 22.4%, 40–49: 21.9%, 50–59: 11.8%, 60–70: 15.6%; education 0–8 years: 17.1%, 9–11: 27.9%, 12: 26.1%, 13–15: 17.4%, ⩾16: 11.5% (Shen *et al*. 2006). The 5201 face-to-face interviews were administered by trained lay-interviewers at respondents' homes between November 2001 and February 2002. The response rate was 74.8% in Beijing and 74.6% in Shanghai. The interview schedule was divided into two parts to allow early termination of a representative subsample of respondents with no evidence of lifetime psychopathology. Part 1 was administered to all 5201 respondents to diagnostically assess core DSM-IV mental disorders. Those who met criteria for at least one mental disorder during the Part-1 interview and a 25% probability subsample of other Part-1 respondents (*n*=1628) received the Part-2 interview. The Part-1 sample was weighted to adjust for differential probabilities of selection within households and for differences in intensity of recruitment effort among hard-to-recruit respondents. A second weight was applied to the Part-2 subsample to adjust for the lower selection probabilities for Part-1 respondents without a mental disorder (Shen *et al*. 2006; Heeringa *et al*. 2008). This study was approved by ethics committees of the local institutions and all respondents provided written informed consent.

Measures

Mental disorder diagnoses were based on the WMH 3.0 version of the World Health Organization (WHO) Composite International Diagnostic Interview (WMH-CIDI; Kessler & Üstün, 2004). This instrument was translated into Chinese using the standard WHO protocol in which a team of survey experts completed the initial translation and a separate team carried out an independent back-translation to ensure preservation of the meaning of the original English version. Discrepancies between translation and back-translation were adjusted. Blind clinical reappraisal interviews were administered to Chinese psychiatric patients and normal controls. WMH-CIDI diagnoses exhibited good concordance with diagnoses generated by semi-structured diagnostic interview schedules (Huang *et al*. 2008).

Generating diagnoses according to the definitions of the DSM-IV diagnostic systems (APA, 1994), the WMH-CIDI measured four disorder groups encompassing 15 specific disorders: anxiety disorders (panic disorder, generalized anxiety disorder, specific phobia, social phobia, post-traumatic stress disorder and separation anxiety disorder), mood disorders (major depressive disorder, dysthymia and bipolar disorder), impulse-control disorders (intermittent explosive disorder, conduct disorder) and substance use disorders (alcohol abuse, alcohol dependence with abuse, drug abuse, drug dependence with abuse). The age-of-onset (AOO) of disorders was investigated retrospectively. As retrospective AOO reports may be inaccurate (Simon & VonKorff, 1995), we used a special question sequence that experimental research has shown to yield more plausible responses than standard age-of-onset questions (Knauper *et al*. 1999). This began with questions designed to emphasize the importance of accurate response: 'Can you remember your *exact* age the *very first* time (emphasis in original) when you had (the symptom/the syndrome)?' Respondents who answered 'no' were probed for a bound of uncertainty by moving up the age range incrementally (e.g. 'Was it before you went to school?' and 'Was it before you entered your teenage years?'). To produce a conservative estimate, onset was set at the upper end of the bound of uncertainty (e.g. 'age 20' was recorded when a respondent reported 15–20 years).

Twelve FCAs occurring before 18 years of age were dichotomously measured in the Part-2 sample. They included parental death, divorce and other parental loss, parents' substance abuse, other parents' mental disorders, parents' criminality and marital violence, childhood physical abuse, sexual abuse and neglect, serious respondent physical illness and family economic adversity. Besides parental death, parental divorce and other parental separations (adoption, foster placement, living with other relatives instead of parents) were included in

the assessment of interpersonal losses in the baseline WMH survey. The latter also had measures for parental criminality, family economic adversity and sexual abuse. The Family History Research Diagnostic Criteria Interview (Endicott *et al*. 1978) and its extensions (Kendler *et al*. 1991) were applied to assess parental mental disorders (major depression, generalized anxiety disorder, panic disorder, antisocial personality disorder and substance abuse). Family violence and physical abuse of the respondent were assessed by using a modified version of the Conflict Tactics Scale (Straus, 1979). Physical abuse included 'beat, slapped, hit, pushed, grabbed or shoved or threw something at the child' by father or mother (including biological, step- or adoptive parents) or by the people who raised the child. Neglect was assessed with questions used in child welfare research about frequency of not having adequate food, clothing or medical care, having inadequate supervision, and having to do age-inappropriate chores (Courtney *et al*. 1998). To ensure a better response, sexual abuse (which included sexual intercourse, penetration with a finger or object, or sexual assault or molestation) was not asked in a way that identified whether it was from a family member or not. Those who reported that any of these experiences occurred to them three or more times were coded as having experienced family sexual abuse because previous studies have shown that cases involving one or two instances were typically abuse by a stranger whereas those involving three or more instances typically involved a family member (Molnar *et al*. 2001).

Statistical analysis

As some kinds of FCAs were rarely reported, the results of factor analysis and association analysis of the 12 FCAs were unstable. Therefore, all 12 FCAs were combined into several rational categories (Table 1). As previous studies found that neglect, sexual and physical abuse are strongly correlated (Dong *et al*. 2004; Green *et al*., in press), and given that each of them alone was uncommon in the sample, a category that included all these three CAs was adopted. In addition, we combined the parental substance abuse and other mental disorders as parental mental disorders, parents' marital violence and criminalities as parental maladjustment, and parents' divorce and other parental loss as parental loss other than death. Parental death and respondents' serious physical illness were retained by themselves. As no respondents reported family economic adversity, the 12 FCAs were finally regrouped into six categories. The factor structure among the six categories of FCAs was then first examined from tetrachoric inter-correlation and factor analysis with promax rotation. The bivariate and multivariate models of FCAs with onset of each DSM-IV/CIDI disorder were then estimated using discrete-time survival analysis with person-years as the unit of analysis (Willett & Singer, 1993). Respondents' age at interview, gender, and other DSM-IV/CIDI disorders that had onsets prior to the age of onset and up to age 17 were controlled in each model. These controls were required to adjust for the predictive effects of the FCAs on temporally secondary disorders through direct effects on earlier-onset disorders that predicted the secondary disorders. Akaike's Information Criterion (AIC; Burnham & Anderson, 2002) was used to select the best-fitting multivariate model among the above models. This best-fitting model was then used to estimate associations in subsamples defined by life-course stage of AOO and class of disorder (mood, anxiety, substance and impulse-control disorders). The odds ratios (ORs) and 95% confidence intervals (CIs) of each predictor included in the above survival multivariate models are reported.

We also estimated the Population Attributable Risk Proportion (PARP) for the best-fitting model. The PARP can be understood as the proportion of observed outcome disorders that would not have occurred in the absence of the measured FCAs if the ORs in the best-fitting model were truly caused by the effects of these FCAs (Northridge, 1995). PARPs were calculated by generating individual-level predicted probabilities of the outcome disorders twice from the coefficients in the best-fitting model: the first time using all the coefficients

in the model and the second time assuming that the coefficients associated with the FCAs were all zero. PARP then equaled one minus the ratio of the predicted prevalence estimates in the two specifications. As the data are both clustered and weighted, the standard errors of ORs in the above survival models were estimated by the design-based Taylor series method (Wolter, 1985) implemented in the SUDAAN software system (SUDAAN, 2002) and the statistical significance of coefficients was evaluated using $p<0.05$-level two-sided tests.

Results

Prevalence

Nearly one-third (31.0%) of respondents reported at least one FCA (Table 1). The most common FCAs were parental death (11.1%), parental loss other than death (9.5%) and physical abuse (8.9%).

Co-occurrence and factors of FCAs

Among respondents with at least one category of FCAs, the percentage of respondents who also had at least one other FCA ranged from 25.8% (for those who reported parental death) to 85.4% (Table 2). Eleven of the 15 tetrachoric correlations between pairs of FCAs (73.3%) were positive. Negative values were mild in magnitude (all around −0.01). Positive values ranged from 0.03 to 0.23 with an interquartile range (25th–75th percentiles) of 0.04–0.14. Factor analysis showed three meaningful factors (Table 2). Half of the six FCAs (namely, parental mental disorders, parental maladjustment and childhood maltreatment) had significant loadings on the first factor, which could be named ‘family dysfunction’. Factor loadings of each FCA were in the range 0.56–0.79. The other two factors were specific. The second factor represented other parental loss and other CA with factor loadings of 0.69 and 0.75 respectively. The third factor only included parental death (factor loading 0.98). The FCAs in Factor 1 and the remaining FCAs are referred to below as ‘family-dysfunction’ FCAs and ‘other’ FCAs.

The best model for FCAs predicting the first onset of DSM-IV/CIDI disorders

Analysis of the predictive effects of FCAs on first onset of any one of the 15 DSM-IV/CIDI disorders by the bivariate models (i.e. only one category of FCA considered at a time) showed that four of the six FCAs (except parental death and serious physical illness) were significantly associated with disorder onset (OR 1.88–3.21) (Table 3). In the additive multivariate model, which corrected the overestimation of effects of individual FCAs by bivariate models, the ORs decreased and only parental mental disorders (OR 2.57) and childhood maltreatment (OR 2.60) remained significantly associated (Table 3). The joint effect of all FCAs in this model was statistically significant [$\chi^2_{(6)}=101.04$, $p<0.001$]. A test for variation in ORs showed that the hypothesis of the ORs being the same for all FCAs could be rejected [$\chi^2_{(5)}=27.8$, $p<0.001$].

The multivariate model that considered only number but not type of FCAs showed that the ORs generally increased with number of FCAs, from 1.68 for exactly one FCA (compared to respondents who had no CA) to 3.92 for three or more FCAs. The joint effect of number-of-FCAs was also statistically significant [$\chi^2_{(3)}=46.72$, $p<0.001$] (Table 3). We then estimated a model that included predictors both for type of FCAs and for number of FCAs. Inspection of the AIC showed that this model (AIC=5129.5) fitted better than the model that only considered number (AIC=5148.9) but not type (AIC=5128.7) of FCAs. We tried to refine the models by distinguishing between number of family-dysfunction FCAs and number of other FCAs. In this refined and best-fitting model (AIC=5112.3), the type-of-

FCA predictors were significant even after controlling for any two kinds of FCAs [$\chi^2_{(6)}$=65.05, p<0.001], whereas both numbers of family-dysfunction FCAs [$\chi^2_{(2)}$=8.77, p=0.013] and other FCAs [$\chi^2_{(1)}$=6.45, p=0.011] were significant after controlling for type of FCAs (Table 3). All ORs of associations with type of FCAs were somewhat higher than in the additive model, indicating that the additive assumption had a downward bias in estimating the effects of individual FCAs. This was because the ORs associated with number of FCAs in the final refined model were mostly less than 1.0 and became lower as the number of FCAs increased. Thus, although the odds of disorder onset increased with increasing number of FCAs, they increased at a significantly decreasing rate with increases in number of FCAs. The additive model failed to consider this subadditive interaction and underestimated the main effects of the individual FCAs. As in the additive model, a test for variation in ORs rejected that the ORs were the same for all types of FCAs [$\chi^2_{(5)}$=49.5, p<0.001]; the family-dysfunction FCAs consistently had higher ORs than other FCAs. Several complex inherently nonlinear models we also considered did not improve on the fitness of the previous simpler models. Therefore, the best-fitting model above was adopted in disaggregated analyses.

Differential predictive effects by class of DSM-IV/ CIDI disorder

Disaggregation of respondents' mental disorders showed that FCAs were significantly associated with subsequent first onsets of four disorder groups. Type of FCAs was generally associated with increased risk [$\chi^2_{(5)}$=24.02 − 102.03, p<0.001]. Specifically, 12 of 24 analyzed pairs of FCAs showed significant associations and 10 of these 12 significant associations increased the risks (OR > 1.00) of subsequent disorders, except for the two associations of substance use disorder with parental death and serious physical illness. Among the 10 positive associations, nine were associations between family-dysfunction FCA and disorders. The significant risk estimates for these nine FCAs were higher than the one included in other FCAs (OR 2.57–19.98 *v*. 2.11) (Table 4). Moreover, although each family-dysfunction FCA (except parental maladjustment) predicted onset of each disorder group, it is striking that the ORs did not differ significantly across the subsequent disorders [$\chi^2_{(3)}$=0.83 − 4.97, p>0.05]. Among 12 ORs of number-of-FCAs, 10 of them (except the ORs for associations between having three FCAs and anxiety disorders, and between having two FCAs and substance use disorders) decreased with increasing number of FCAs; six of these 10 ORs were significant.

Differential predictive effects by life-course stage

Disaggregation of the best-fitting model by life-course stage (childhood: ages 4–12, adolescence to early adulthood: ages 13–24, middle to later adulthood: ages ⩾25) showed that the significant effects of FCAs on first onsets were found throughout the life course (Table 5). However, for the first stage, only parental mental disorder was significantly associated. For the latter two stages, all types of family-dysfunction FCAs were significantly associated. The average ORs for the second stage were the highest among the three stages, although the patterns were not statistically significant. Moreover, one type of other FCAs (other parental loss) was significantly associated with high risk of disorder onset during the second stage. Regarding number of FCAs, onset during the two latter stages was significantly associated with number of family-dysfunction FCAs [$\chi^2_{(2)}$=6.36 − 9.92, p=0.007–0.042], whereas the number of other FCAs was not significantly associated with onset during any stage.

Population-level predictive effects of FCAs

To evaluate population-level predictive effects of FCAs, PARPs were calculated according to the best-fitting model. The results showed that all FCAs together could explain 38.5% of first onset of any mental disorders (Table 3), 41.5% of mood disorders, 34.5% of anxiety disorders, 57.2% of impulse-control disorders, and 37.2% of substance disorders (Table 4). All FCAs also explained 19.4%, 51.2% and 33.3% of first onset of any mental disorders during the three life-course stages of AOO, respectively (Table 5).

Discussion

Compared to the prevalence of childhood maltreatment found in previous Chinese studies (7.0–22.1% for sex abuse, 40.7–56.3% for all childhood maltreatment) (Kim *et al*. 2000; Chen *et al*. 2004; Chen, 2005; Zhu *et al*. 2006*a*; Chang & Wang, 2008; Xie *et al*. 2008), our prevalence estimate (10.4%) was lower. Apart from restricted sampling and inclusion of non-family CAs in those studies, the discrepancy could be due to the different modes of questioning used. Thus, the WHM-CIDI asked about ‘sexual assault’ with two questions (namely, ‘The next two questions are about sexual assault. The first is about rape. Did that ever happen to you? Apart from rape, were you ever sexually assaulted or molested?’), whereas several Chinese studies separately asked about 12 kinds of overlapping adverse sexual experiences (ranging from indecent exposure and masturbation to penetration) (Chen *et al*. 2004). Moreover, most of the Chinese studies recruited school students. A recent study found that nearly all (97%) Chinese child health doctors and nurses believed that physical punishment of children was widely used in China, but those who were older were significantly more tolerant of it, especially for children aged 4–13 (Hesketh *et al*. 2000). Conceivably, our older respondents might be less likely to report physical punishment as ‘abuse’.

Using an identical survey procedure to study a nationally representative sample in the USA, the National Comorbidity Survey Replication (NCS-R) found a higher estimate of FCAs (53.4% *v*. 31.0%) than our study (Green *et al*., in press). This may reflect genuine cross-national differences in prevalence, in addition to culturally mediated differential reporting. For example, although divorce rate has been increasing in China, it is still much lower than in the USA, especially during the period when most respondents spent their childhood (Zeng & Wu, 1997). Only 2.5% of our respondents (*v*. 5.8% in the USA) reported serious physical illness. This might be because physical illnesses were less likely to be recognized in China’s underdeveloped health-care system. It may seem strange that 10.6% of respondents in the USA as opposed to none in China reported economic adversity. We speculate that because most of our respondents spent their childhood during a socialist era characterized by collective economy and equalitarianism, they might not experience poverty as an adversity. Chinese attitudes toward ‘physical punishment’ to children could set a higher threshold for reporting of certain FCAs. There are popular sayings that approve of physical punishment as a way of building character, such as ‘beating is caring and scolding is loving’ and ‘the rod makes a filial son’ (Qiao & Chan, 2005). Stigma and the belief that ‘shameful affairs should not be spread outside the family’ could also cause under-reporting of morally sensitive FCAs (Chen *et al*. 2004; Qiao & Chan, 2005). This explanation is supported by the comparable prevalence of less stigmatizing FCAs such as parental death between our study (11.1%) and the NCS-R (9.9%).

Our other findings are consistent with both US and other studies. Family dysfunction emerged as the main factor in factor analysis. CAs were inter-related and associated with a broad spectrum of mental disorders. Multivariate effects of FCAs were broadly subadditive so that bivariate analyses might not accurately estimate the individual effects of CAs (Ney *et al*. 1994; Kessler *et al*. 1997; Dong *et al*. 2004; Arata *et al*. 2007; Collishaw *et al*. 2007;

Green *et al*., in press). Importantly, finding significant mental health impacts of a limited number of CAs in both Western and Chinese studies could be inadequate for the quantitative estimation of their effects. This is because CAs such as abuse and neglect were associated and interacted with many other uncontrolled FCAs that contributed to psychopathology. Consistent with the NCS-R, we found family-dysfunction FCAs to be more associated with psychopathology than other FCAs. As the most severe FCAs were chronic intra-familial adversities involving the use of physical force (Clemmons *et al*. 2007), future studies should consider severity in addition to the cumulative number of adversities. Finally, we found the same lack of specificity on association between family-dysfunction FCAs and disorder groups. This may point to general causal pathways that defied early theories (Tennant *et al*. 1980) and studies that focused specifically on child abuse (McMahon *et al*. 2003; Shanahan *et al*. 2008).

Although previous studies documented long-term predictive effects of some CAs (Horwitz *et al*. 2001; Edwards *et al*. 2003), they almost entirely focused on prevalent rather than first-onset disorders. By evaluating PARPs according to the best-fitting model, our study documented long-term multivariate predictive effects of FCAs beyond early adulthood. This provided cross-national empirical justification for exploring hypotheses regarding the effects of various mediators on developmental progression and their interactive relationships. The overall consistency notwithstanding, two differences in the pattern of association between the NCS-R and our study are worth noting. The former found that the PARPs declined steadily with increasing age. By contrast, the highest PARP in our study was shown for disorders onset from adolescence to early adulthood (13–24 years). This difference could arise partly from our failure to measure certain childhood disorders such as attention deficit/hyperactivity disorder (ADHD). Different symptom constellations and reporting across age groups in Western and Chinese populations may also contribute. We also found the average PARPs for all disorder groups higher than in the NCS-R (mood: 41.5% *v*. 26.2%; anxiety: 34.5% *v*. 32.4%; substance: 37.2% *v*. 21.0%; impulse-control: 57.2% *v*. 41.2%), although this did not reach statistical significance. This pattern of higher association in a Chinese than a US community might seem contrary to the popular claim for a protective effect of strong family values among Chinese individuals (Chen *et al*. 1993). It is possible that negative family events in a society that treasures family values might bring about more negative effects on mental health. That milder FCAs could be more likely to be reported in the USA than China might also contribute.

Our findings have clinical and policy implications. Although China is a signatory to the UN Convention on the Rights of the Child, there has been no formal child protection system or family service beyond a rarely implemented law on protecting people not reaching adulthood. A study of 331 child health doctors and nurses in Zhejiang province indicated that none of them had received training in the management of child abuse and that 85% would not consider child abuse when faced with an injured child (Hesketh *et al*. 2000). There is therefore a need to develop multisector mechanisms for the early management of FCAs, thereby reducing their impact on mental health in China.

Regarding the limitations of this study, our estimates of the prevalence of FCAs could be conservative because of downward bias from retrospective recall (Hardt & Rutter, 2004), whereas those of mental disorders could be affected by the validity of the WMH-CIDI (3.0) in our survey, especially among older respondents (Shen *et al*. 2006; Lee *et al*. 2007). The CAs we examined were by no means comprehensive. Non-familial CAs and other FCAs such as the quality of care after a parent’s death may also have an effect on mental disorders, but these were not measured. As some FCAs were rarely reported by respondents, we did not have large enough subsample sizes to assess the individual and interactive effects of every FCA. We did not consider the timing, sequencing and persistence of the individual

FCAs studied and other forms of abuse such as emotional and/or verbal abuse. Our analysis of the joint effects of FCAs focused on broad patterns of interactions without evaluating interactions in detail. This approach is an approximation that may miss potentially important relationships, such as how parental divorce might in fact diminish exposure to stressful family situations and thus protect against the onset of mental disorders (Amato, 1993; Hetherington & Stanley-Hagan, 1999).

It should be emphasized that, because the onset of most mental disorders may be triggered by the interaction between genetic and environmental factors (Caspi *et al*. 2003; Kendler *et al*. 2005), and parental mental disorders might be correlated with other FCAs, the associations we found might partly reflect parental genetic effects on children's mental disorders. The effect of the FCAs might be inflated because we failed to control the aforementioned factors (including non-familial CAs, other FCAs and salient biological markers) that may be involved in the etiology of mental disorders and also correlated with FCAs. Finally, despite the profound transformations that have occurred in China, the WMH-CIDI did not examine the impact of specific social context and individual experience. Future research could thus examine how the extreme political turmoil and stable economic times that older and younger Chinese respondents were respectively exposed to could be associated with complex inter-cohort variations in the relationship between onset of mental disorders (Lee *et al*. 2007) and experience of FCAs.

Acknowledgments

The Chinese WMH Survey Initiative is supported by the Pfizer Foundation in conjunction with the WHO WMH Survey Initiative. We thank the WMH staff for assistance with instrumentation, fieldwork and data analysis. These activities were supported by the United States National Institute of Mental Health (R01MH070884), the Mental Health Burden Study (Contract number HHSN271200700030C), the John D. and Catherine T. MacArthur Foundation, the Pfizer Foundation, the US Public Health Service (R13-MH066849, R01-MH069864 and R01 DA016558), the Fogarty International Center (FIRCA R01-TW006481), the Pan American Health Organization, Eli Lilly and Company, Ortho-McNeil Pharmaceutical, Inc., GlaxoSmithKline, Bristol-Myers Squibb and Sanofi-Aventis.

References

Amato PR. Children's adjustment to divorce: theories, hypotheses, and empirical support. Journal of Marriage and Family 1993;55:23–38.

APA. Diagnostic and Statistical Manual of Mental Disorders. 4th edn. Washington, DC: American Psychiatric Association; 1994.

Arata CM, Langhinrichsen-Rohling J, Bowers D, O'Brien N. Differential correlates of multi-type maltreatment among urban youth. Child Abuse and Neglect 2007;31:393–415. [PubMed: 17412420]

Brown GW, Bifulco A, Harris TO. Life events, vulnerability and onset of depression: some refinements. British Journal of Psychiatry 1987;150:30–42. [PubMed: 3651696]

Burnham, KP.; Anderson, DR. Model Selection and Multimodel Inference: A Practical Information-Theoretic Approach. 2nd edn. New York: Springer-Verlag; 2002.

Cao WS, Yu HH, Xu CG, Jiao ZA. Childhood maltreatment experiences of patients with both obsessive-compulsive disorder and personality disorders [in Chinese]. Chinese Mental Health Journal 2007;21:481–483. 487.

Caspi A, Sugden K, Moffitt TE, Taylor A, Craig IW, Harrington H, McClay J, Mill J, Martin J, Braithwaite A, Poulton R. Influence of life stress on depression: moderation by a polymorphism in the 5-HTT gene. Science 2003;301:386–389. [PubMed: 12869766]

Chang XL, Wang HY. Effect of psychological abused and neglect in childhood on adult mental health [in Chinese]. China Journal of Health Psychology 2008;16:1239–1241.

Chen CN, Wong J, Lee N, Chan-Ho MW, Lau TF, Fung M. The Shatin Community Mental Health Survey in Hong Kong II. Major findings. Archives of General Psychiatry 1993;50:125–133. [PubMed: 8427552]

Chen J. Childhood physical and emotional maltreatment and its psychological effects in 391 university students in China [in Chinese]. Chinese Journal of School Doctor 2005;19:341–344.

Chen J, Dunne MP, Han P. Child sexual abuse in China: a study of adolescents in four provinces. Child Abuse and Neglect 2004;28:1171–1186. [PubMed: 15567022]

Chen J, Zhang J, Zhang W, Feng J. The relationship between childhood abuse and clinical features of depressive patients [in Chinese]. Journal of Psychiatry 2008;21:258–260.

Clemmons JC, Walsh K, DiLillo D, Messman-Moore TL. Unique and combined contributions of multiple child abuse types and abuse severity to adult trauma symptomatology. Child Maltreatment 2007;12:172–181. [PubMed: 17446570]

Collishaw S, Pickles A, Messer J, Rutter M, Shearer C, Maughan B. Resilience to adult psychopathology following childhood maltreatment: evidence from a community sample. Child Abuse and Neglect 2007;31:211–229. [PubMed: 17399786]

Comijs HC, Beekman AT, Smit F, Bremmer M, van Tilburg T, Deeg DJ. Childhood adversity, recent life events and depression in late life. Journal of Affective Disorders 2007;103:243–246. [PubMed: 17291592]

Courtney, ME.; Piliavin, I.; Grogan-Kaylor, A.; Nesmith, A. Foster Youth Transitions to Adulthood: A Longitudinal View of Youth Leaving Care. Madison, WI: Institute for Research on Poverty; 1998.

Dong M, Anda RF, Felitti VJ, Dube SR, Williamson DF, Thompson TJ, Loo CM, Giles WH. The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. Child Abuse and Neglect 2004;28:771–784. [PubMed: 15261471]

Dong M, Anda RF, Felitti VJ, Williamson DF, Dube SR, Brown DW, Giles WH. Childhood residential mobility and multiple health risks during adolescence and adulthood: the hidden role of adverse childhood experiences. Archives of Pediatrics and Adolescent Medicine 2005;159:1104–1110. [PubMed: 16330731]

Dube SR, Anda RF, Felitti VJ, Chapman DP, Williamson DF, Giles WH. Childhood abuse, household dysfunction, and the risk of attempted suicide throughout the life span: findings from the Adverse Childhood Experiences Study. Journal of the American Medical Association 2001;286:3089–3096. [PubMed: 11754674]

Dube SR, Miller JW, Brown DW, Giles WH, Felitti VJ, Dong M, Anda RF. Adverse childhood experiences and the association with ever using alcohol and initiating alcohol use during adolescence. Journal of Adolescent Health 2006;38:444.e1–444.e10. [PubMed: 16549308]

Edwards VJ, Holden GW, Felitti VJ, Anda RF. Relationship between multiple forms of childhood maltreatment and adult mental health in community respondents: results from the Adverse Childhood Experiences Study. American Journal of Psychiatry 2003;160:1453–1460. [PubMed: 12900308]

Endicott, J.; Andreasen, N.; Spitzer, RL. Family History Research Diagnostic Criteria. New York: Biometrics Research, New York State Psychiatric Institute; 1978.

Fergusson DM, Horwood LJ, Lynskey MT. Childhood sexual abuse and psychiatric disorder in young adulthood: II. Psychiatric outcomes of childhood sexual abuse. Journal of the American Academy of Child and Adolescent Psychiatry 1996;35:1365–1374. [PubMed: 8885591]

Finkelhor D, Ormrod RK, Turner HA. Poly-victimization: a neglected component in child victimization. Child Abuse and Neglect 2007;31:7–26. [PubMed: 17224181]

Fristad MA, Jedel R, Weller RA, Weller EB. Psychosocial functioning in children after the death of a parent. American Journal of Psychiatry 1993;150:511–513. [PubMed: 8434672]

Green JG, McLaughlin KA, Berglund PA, Gruber MJ, Sampson NA, Zaslavsky AM, Kessler RC. Childhood adversities and adult psychiatric disorders in the national comorbidity survey replication I: associations with first onset of DSM-IV disorders. Archives of General Psychiatry 2010;67:113–123. [PubMed: 20124111]

Hardt J, Rutter M. Validity of adult retrospective reports of adverse childhood experiences: review of the evidence. Journal of Child Psychology and Psychiatry 2004;45:260–273. [PubMed: 14982240]

Heeringa, SG.; Wells, JE.; Hubbard, F.; Mneimneh, ZN.; Chiu, WT.; Sampson, NA.; Berglund, PA. Sample designs and sampling procedures. In: Kessler, RC.; Üstün, TB., editors. The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders. New York: Cambridge University Press; 2008. p. 14-32.

Hesketh T, Hong ZS, Lynch MA. Child abuse in China: the views and experiences of child health professionals. Child Abuse and Neglect 2000;24:867–872. [PubMed: 10888025]

Hetherington EM, Stanley-Hagan M. The adjustment of children with divorced parents: a risk and resiliency perspective. Journal of Child Psychology and Psychiatry 1999;40:129–140. [PubMed: 10102729]

Horwitz AV, Widom CS, McLaughlin J, White HR. The impact of childhood abuse and neglect on adult mental health: a prospective study. Journal of Health and Social Behavior 2001;42:184–201. [PubMed: 11467252]

Huang, YQ.; Liu, ZR.; Zhang, MY.; Shen, YC.; Tsang, A.; He, YL.; Lee, S. Mental disorders and service use in China. In: Kessler, RC.; Üstün, TB., editors. The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders. New York: Cambridge University Press; 2008. p. 447-473.

Kendler KS, Kuhn JW, Vittum J, Prescott CA, Riley B. The interaction of stressful life events and a serotonin transporter polymorphism in the prediction of episodes of major depression. Archives of General Psychiatry 2005;62:529–535. [PubMed: 15867106]

Kendler KS, Silberg JL, Neale MC, Kessler RC, Heath AC, Eaves LJ. The family history method: whose psychiatric history is measured? American Journal of Psychiatry 1991;148:1501–1504. [PubMed: 1928463]

Kessler RC, Berglund P, Chiu WT, Demler O, Heeringa S, Hiripi E, Jin R, Pennell BE, Walters EE, Zaslavsky A, Zheng H. The US National Comorbidity Survey Replication (NCS-R): design and field procedures. International Journal of Methods in Psychiatric Research 2004;13:69–92. [PubMed: 15297905]

Kessler RC, Davis CG, Kendler KS. Childhood adversity and adult psychiatric disorder in the US National Comorbidity Survey. Psychological Medicine 1997;27:1101–1119. [PubMed: 9300515]

Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, Wittchen HU, Kendler KS. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. Archives of General Psychiatry 1994;51:8–19. [PubMed: 8279933]

Kessler RC, Üstün TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). International Journal of Methods in Psychiatric Research 2004;13:93–121. [PubMed: 15297906]

Kim DH, Kim KI, Park YC, Zhang LD, Lu MK, Li D. Children's experience of violence in China and Korea: a transcultural study. Child Abuse and Neglect 2000;24:1163–1173. [PubMed: 11057703]

Knauper B, Cannell CF, Schwarz N, Bruce ML, Kessler RC. Improving the accuracy of major depression age of onset reports in the US National Comorbidity Survey. International Journal of Methods in Psychiatric Research 1999;8:39–48.

Lee S, Tsang A, Zhang MY, Huang YQ, He YL, Liu ZR, Shen YC, Kessler RC. Lifetime prevalence and inter-cohort variation in DSM-IV disorders in metropolitan China. Psychological Medicine 2007;37:61–71. [PubMed: 17038208]

Luo Y, Parish WL, Laumann EO. A population-based study of childhood sexual contact in China: prevalence and long-term consequences. Child Abuse and Neglect 2008;32:721–731. [PubMed: 18614231]

McLaughlin KA, Green JG, Gruber MJ, Sampson NA, Zaslavsky AM, Kessler RC. Childhood adversities and adult psychopathology in the National Comorbidity Survey Replication (NCS-R) III: Associations with functional impairment related to DSM-IV disorders. Psychological Medicine. 2009 Published online: 7 September 2009. doi:10.1017/S0033291709991115.

McMahon SD, Grant KE, Compas BE, Thurm AE, Ey S. Stress and psychopathology in children and adolescents: is there evidence of specificity? Journal of Child Psychology and Psychiatry 2003;44:107–133. [PubMed: 12553415]

Molnar BE, Buka SL, Kessler RC. Child sexual abuse and subsequent psychopathology: results from the National Comorbidity Survey. American Journal of Public Health 2001;91:753–760. [PubMed: 11344883]

Mullen PE, Martin JL, Anderson JC, Romasn SE, Herbison GP. The long-term impact of the physical, emotional, and sexual abuse of children: a community study. Child Abuse and Neglect 1996;20:7–21. [PubMed: 8640429]

Ney P, Fung T, Wickett A. The worst combinations of child abuse and neglect. Child Abuse and Neglect 1994;18:705–715. [PubMed: 8000901]

Northridge ME. Public health methods - attributable risk as a link between causality and public health action. American Journal of Public Health 1995;85:1202–1204. [PubMed: 7661224]

Pennell, BE.; Mneimneh, ZN.; Bowers, A.; Chardoul, S.; Wells, JE.; Viana, MC.; Dinkelmann, K.; Gebler, N.; Florescu, S.; He, Y.; Huang, Y.; Tomov, T.; Vilagut, G. Implementation of the World Mental Health Surveys. In: Kessler, RC.; Üstün, TB., editors. The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders. New York: Cambridge University Press; 2008. p. 33-57.

Qiao PD, Chan YC. Child abuse in China: a yet-to-be-acknowledged 'social problem' in the Chinese mainland. Child and Family Social Work 2005;10:21–27.

Schilling EA, Aseltine RH, Gore S. The impact of cumulative childhood adversity on young adult mental health: measures, models, and interpretations. Social Science and Medicine 2008;66:1140–1151. [PubMed: 18177989]

Shanahan L, Copeland W, Costello EJ, Angold A. Specificity of putative psychosocial risk factors for psychiatric disorders in children and adolescents. Journal of Child Psychology and Psychiatry 2008;49:34–42. [PubMed: 18181879]

Shen YC, Zhang MY, Huang YQ, He YL, Liu ZR, Cheng H, Tsang A, Lee S, Kessler RC. Twelve-month prevalence, severity, and unmet need for treatment of mental disorders in metropolitan China. Psychological Medicine 2006;36:257–267. [PubMed: 16332281]

Simon GE, VonKorff M. Recall of psychiatric history in cross-sectional surveys: implications for epidemiologic research. Epidemiologic Reviews 1995;17:221–227. [PubMed: 8521941]

Straus MA. Measuring intrafamily conflict and violence: the Conflict Tactics (CT) scales. Journal of Marriage and Family 1979;41:75–88.

SUDAAN. SUDAAN: Professional Software for Survey Data Analysis [Computer Program]. Version 8.0.1. Research Triangle Park, NC: Research Triangle Institute; 2002.

Sun YP, Duan YP, Sun DF, Yi MJ, Gao FG, Wang J. Study on the risk factors and characteristics on childhood sexual abuse among female students in a college [in Chinese]. Chinese Journal of Epidemiology 2005;26:947–950. [PubMed: 16676587]

Tennant C, Bebbington P, Hurry J. Parental death in childhood and risk of adult depressive disorders: a review. Psychological Medicine 1980;10:289–299. [PubMed: 7384330]

Wark MJ, Kruczek T, Boley A. Emotional neglect and family structure: impact on student functioning. Child Abuse and Neglect 2003;27:1033–1043. [PubMed: 14550330]

Willett JB, Singer JD. Investigating onset, cessation, relapse, and recovery: why you should, and how you can, use discrete-time survival analysis to examine event occurrence. Journal of Consulting and Clinical Psychology 1993;61:952–965. [PubMed: 8113496]

Wolter, KM. Introduction to Variance Estimation. New York: Springer-Verlag; 1985.

Wong WC, Leung PW, Tang CS, Chen WQ, Lee A, Ling DC. To unfold a hidden epidemic: prevalence of child maltreatment and its health implications among high school students in Guangzhou, China. Child Abuse and Neglect 2009;33:441–450. [PubMed: 19586660]

Xie ZJ, Tang QP, Chang XL, Deng YL. 457 college students' experience of psychological abuse and neglect in childhood and mental health [in Chinese]. Chinese Journal of Clinical Psychology 2008;16:63–65.

Xu CG, Jiao ZA, Cao WS, Yu HH. Relationship of depressive disorder and childhood maltreated experiences [in Chinese]. Journal of Psychiatry 2007;20:147–149.

Zeng Y, Wu D. Changes in the divorce rate and age distribution in China since the 1980s. Social Sciences in China 1997;18:106–112. [PubMed: 12348606]

Zhu XH, Li J, Liang GL, Wei XY. Mental health and alexithymia of technical school student abused in childhood [in Chinese]. Chinese Mental Health Journal 2006a;20:643–645.

Zhu XH, Liang GL, Li J, Wei XY, Tian YX. Effect of childhood abuse on attitude of committing suicide and suicide ideation [in Chinese]. Chinese Mental Health Journal 2006b;20:462–464.

Table 1

Prevalence of family childhood adversities (FCAs)

	Unweighted	Prevalence	
Adversity	***n***	**%**	**(S.E.)**
I. Childhood maltreatment	203	10.4	(1.1)
Physical abuse	179	8.9	(1.0)
Sexual abuse	13	0.6	(0.3)
Neglect	27	1.8	(0.5)
II. Parental maladjustment	53	2.2	(0.4)
Violence	42	1.9	(0.4)
Criminality	12	0.3	(0.1)
III. Parental mental disorders	124	5.4	(0.7)
Substance abuse	110	4.8	(0.7)
Other mental disorders	18	0.9	(0.3)
IV. Parental death	198	11.1	(1.2)
V. Parental loss other than death	165	9.5	(0.9)
Parents' divorce	29	1.8	(0.5)
Other parental loss	137	7.7	(0.8)
VI. Serious physical illness	39	2.5	(0.6)
VII. Family economic adversity	0	0.0	(0.0)
Any family childhood adversity	571	31.0	(1.7)

S.E., Standard error.

Table 2

Co-morbidity and factor analysis of family childhood adversities (FCAs)

	Percentage of respondents with a given FCA who also had at least one other FCA		Mean number of FCAs among those with more than one FCA		Factor loadings		
Adversity types	**%**	**(S.E.)**	**Mean no.**	**(S.E.)**	**Factor 1**	**Factor 2**	**Factor 3**
I. Family-dysfunction FCAs (included in Factor 1)							
Parent mental disorders	51.9	(7.4)	2.4	(0.1)	0.63	−0.02	−0.07
Parental maladjustment	85.4	(6.5)	2.5	(0.1)	0.79	−0.12	−0.01
Childhood maltreatment	52.3	(4.6)	2.2	(0.0)	0.56	0.27	0.15
II. Other FCAs (included in Factor 2 or Factor 3)							
Parental death	25.8	(4.4)	2.2	(0.1)	0.01	−0.04	0.98
Parental loss other than death	43.1	(5.5)	2.3	(0.1)	0.12	0.69	−0.15
Serious physical illness	58.9	(12.0)	2.3	(0.1)	−0.12	0.75	0.08

S.E., Standard error.

Table 3

Estimated effects for types and number of family childhood adversities (FCAs) on the first onset of DSM-IV/CIDI disorders in bivariate, multivariate additive, and interactive survival models[a]

	Bivariate[b]		Multivariate[c]		Multivariate (interactive)[d] (with controls for both type and number of FCAs)	
	OR	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
I. Types of FCAs			(without controls for number of FCAs)			
Parent mental disorders	3.21*	(2.05–4.96)	2.57*	(1.47–4.50)	4.03*	(2.18–7.75)
Parental maladjustment	2.99*	(1.44–6.21)	1.19	(0.51–2.76)	3.59*	(1.59–8.12)
Abuse	3.16*	(2.05–4.88)	2.60*	(1.57–4.31)	3.27*	(1.88–5.69)
Parental death	1.10	(0.52–2.36)	1.10	(0.53–2.32)	1.23	(0.58–2.59)
Parental loss other than death	1.88*	(1.18–3.00)	1.56	(0.99–2.45)	1.74*	(1.19–2.54)
Serious physical illness	0.85	(0.48–1.50)	0.66	(0.36–1.21)	1.04	(0.43–2.52)
	–	–	$\chi^2_{(6)}$=101.04*		$\chi^2_{(6)}$=65.05*	
II. Number of all FCAs	–	–	(without controls for type of FCAs)		–	
0	–	–	1.0	–	–	–
1	–	–	1.68*	(1.19–2.37)	–	–
2	–	–	3.89*	(2.23–6.80)	–	–
⩾3	–	–	3.92*	(1.80–8.52)	–	–
	–	–	$\chi^2_{(3)}$=46.72*		–	
III. Number of family-dysfunction FCAs[e]	–	–	–	–		
0–1	–	–	–	–	1.0	–
2	–	–	–	–	0.21*	(0.08–0.59)
3	–	–	–	–	0.19	(0.03–1.16)
	–	–	–	–	$\chi^2_{(2)}$=8.77*	
IV. Number of other FCAs[e]	–	–	–	–	–	–

	Bivariate[b]		Multivariate[c]		Multivariate (interactive)[d] (with controls for both type and number of FCAs)	
	OR	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
0–1	–	–	–	–	1.0	–
2	–	–	–	–	0.24*	(0.08–0.72)
	–	–	–	–	$\chi^2_{(1)}=6.45$*	
PARP, % (95% CI)					38.5	(27.3–49.7)

OR, Odds ratio; CI, confidence interval; PARP, Population Attributable Risk Proportion.

[a] Based on discrete-time survival models with person-year the unit of analysis pooled across 15 different DSM-IV/CIDI disorders, controlling for age at interview, gender, and person-year.

[b] Six separate bivariate models were estimated, one for each FCA.

[c] The multivariate additive model was used for *Types of* FCAs in this column and it was estimated with all six adversities in addition to the controls noted in the first footnote. The multivariate model for *Number of all* FCAs in this column was estimated with dummy predictors for number of adversities without any information about the types of FCAs, in which the same controls used in earlier models were included as well.

[d] The models were estimated with dummy predictors for number of adversities (distinguishing number of family-dysfunction FCAs from number of non-family-dysfunction FCAs) in addition to any information about the types of adversities. The same controls used in earlier models were included as well.

[e] No-one reported more than three family-dysfunction FCAs or more than two non-family-dysfunction FCAs.

* Significant at the $p < 0.05$ level, two-sided test.

Table 4

Estimated effects of types and disaggregated numbers of family childhood adversities (FCAs) on the first onset of four classes of DSM-IV/CIDI disorders[a]

	Mood		Anxiety		Substance use		Impulse-control	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
I. Types of FCAs								
Parent mental disorders	3.36*	(1.69–6.77)	4.36*	(2.20–8.64)	4.05*	(1.96–8.38)	19.98*	(5.76–69.32)
Parental maladjustment	5.74	(0.61–54.02)	0.62	(0.16–2.36)	6.78*	(1.17–39.13)	7.25*	(1.90–27.70)
Childhood maltreatment	4.41*	(2.15–9.05)	3.10*	(1.11–8.64)	2.57*	(1.19–5.58)	2.54	(0.70–9.27)
Parental death	1.80	(0.92–3.50)	1.45	(0.62–3.36)	0.38*	(0.16–0.87)	1.47	(0.28–7.87)
Parental loss other than death	1.34	(0.58–3.08)	1.74	(0.66–4.59)	2.11*	(1.19–3.73)	1.92	(0.75–4.91)
Serious physical illness	1.62	(0.48–5.42)	0.88	(0.24–3.17)	0.23*	(0.07–0.77)	1.96	(0.61–6.23)
$\chi^2_{(6)}$	24.02*		38.40*		33.40*		102.03*	
II. Number of family-dysfunction FCAs								
0–1	1.0	–	1.0	–	1.0	–	1.0	–
2	0.17	(0.02–1.63)	0.12*	(0.02–0.71)	0.27*	(0.05–1.16)	0.10*	(0.02–0.65)
3	0.04	(<0.01–1.20)	1.43	(0.11–18.57)	0.13	(0.01–1.42)	0.03	(0.00–1.08)
$\chi^2_{(2)}$	3.45		10.20*		3.46		5.89	
III. Number of other FCAs								
0–1	1.0	–	1.0	–	1.0	–	1.0	–
2	0.09*	0.01–0.98	0.13*	(0.02–0.73)	1.86	(0.62–5.63)	<0.01*	(<0.01–<0.01)
$\chi^2_{(1)}$	3.92		5.34*		1.22		625.51*	
PARP, % (95% CI)	41.5	(23.1–59.9)	34.5	(18.0–51.0)	37.2	(15.1–59.4)	57.2	(32.3–82.1)

OR, Odds ratio; CI, confidence interval; PARP, Population Attributable Risk Proportion.

[a]See footnotes a and e of Table 2 for a description of the dataset and overall modeling approach. The model used here was estimated with predictors for both types of FCAs and number of adversities (distinguishing number of family-dysfunction FCAs from number of non-family-dysfunction FCAs) in addition to the controls used in the models described in Table 2.

* Significant at the $p < 0.05$ level, two-sided test.

Table 5

Estimated effects of family childhood adversities (FCAs) on the first onset of any disorder by life stage of age of onset[a]

	4–12 years		13–24 years		≥25 years	
	OR	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
I. Types of FCAs						
Parental mental disorders	3.78*	(1.19–12.00)	5.34*	(2.66–10.73)	3.37*	(1.59–7.14)
Parental maladjustment	1.65	(0.42–6.51)	5.19*	(1.57–17.10)	2.94*	(1.04–8.28)
Childhood maltreatment	1.82	(0.63–5.24)	3.91*	(2.08–7.32)	3.47*	(1.62–7.40)
Parental death	0.57	(0.22–1.47)	1.43	(0.61–3.35)	1.34	(0.61–2.94)
Parental loss other than death	1.24	(0.53–2.89)	2.09*	(1.21–3.61)	1.56	(0.78–3.12)
Serious physical illness	<0.01	(<0.01–<0.01)	1.47	(0.37–5.78)	1.06	(0.36–3.15)
$\chi^2_{(6)}$	946.27*		40.18*		30.02*	
II. Number of family-dysfunction FCAs						
0–1	1.0	–	1.0	–	1.0	–
2	0.29	(0.05–1.82)	0.21*	(0.06–0.71)	0.15*	(0.05–0.49)
3	1.13	(0.12–10.40)	0.09*	(0.01–0.94)	0.18	(0.03–1.24)
$\chi^2_{(2)}$	2.46		6.36*		9.92*	
III. Number of non-family-dysfunction FCAs						
0–1	1.0	–	1.0	–	1.0	–
2	0.82	(0.12–5.56)	0.15	(0.02–1.07)	0.30	(0.07–1.31)
$\chi^2_{(1)}$		0.04		3.59		2.55
PARP, % (95% CI)	19.4	(2.2–36.7)	51.2	(35.9–66.5)	33.3	(16.6–50.0)

OR, Odds ratio; CI, confidence interval; PARP, Population Attributable Risk Proportion.

[a]See notes a and e of Table 2 for a description of the dataset and overall modeling approach. The model used here was estimated with predictors for both types of FCAs and number of adversities (distinguishing number of family-dysfunction FCAs from number of non-family-dysfunction FCAs) in addition to the controls used in the models described in Table 2.

*Significant at the p <0.05 level, two-sided test.