Chapter 6

Childhood Maltreatment and the Course of Depressive and Anxiety Disorders: the Contribution of Personality Characteristics

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Abstract

Background: We investigated the effect of childhood maltreatment on predicting the 4-year course of depressive and anxiety disorders and the possible mediating role of personality characteristics in the association between childhood maltreatment and illness course.

Methods: Longitudinal data in a large sample of participants with baseline depressive and/or anxiety disorders (N = 1,474, 18–65 years) were collected in the Netherlands Study of Depression and Anxiety (NESDA). At baseline, childhood maltreatment was assessed with a semi-structured interview. Personality trait questionnaires (NEO-FFI, Mastery Scale and LEIDS), recent stressful life events (LTE-Q), and psychosocial variables were administered. The Life Chart Interview (LCI) was used to determine the time to remission of depressive and/or anxiety disorders.

Results: At baseline, 846 participants (57.4%) reported any childhood maltreatment. Childhood maltreatment had a negative impact on psychosocial functioning and was predictive of more unfavorable personality characteristics and cognitive reactivity styles ($P<0.001$). Childhood maltreatment was a significant predictor of lower likelihood of remission of depressive and/or anxiety disorders (HR=0.94, $P<0.001$). High levels of neuroticism, hopelessness, and external locus of control, and low levels of extraversion were mediating the relationship between childhood maltreatment and 4-year remission of depressive and anxiety disorders.

Conclusions: Certain personality characteristics are key players in the mechanism linking childhood maltreatment to an adverse illness course of depressive and anxiety disorders. Early interventions - reducing neuroticism and hopelessness, and enhancing extraversion and locus of control - might contribute to a better prognosis in a ‘high risk’ group of depressive and anxiety disorders.

Introduction

Previous research has shown that childhood maltreatment predicts an adverse course of depressive and anxiety disorders in adulthood, i.e., increased comorbidity and chronicity of depressive and anxiety disorders (1-3). In addition, childhood maltreatment can result in adverse psychosocial circumstances and unfavorable personality and coping styles.

The effects of childhood maltreatment may continue as adult impairment in psychosocial functioning. Individuals with reported histories of maltreatment lead more disadvantaged lives in general, with less capacity to make and maintain personal and social relationships (4, 5) and lower levels of education, employment, and earnings (6-8). Childhood maltreatment is associated with an increased vulnerability to stressful life events in adulthood, especially in the interpersonal domain (9-12). Prior studies on personality characteristics have demonstrated a positive association between childhood maltreatment and high neuroticism (12-16). Neuroticism is one of the major temperamental personality dimensions, attributing to an increased risk of onset and persistence of affective disorders (17). Higher openness and lower extraversion scores were found in a recent general population-based study of adults exposed to childhood emotional abuse (16). High openness, indicative of curiosity and impulsive sensation seeking, has been linked to an increased risk for revictimization (15). Low extraversion scores, reflecting the lack of enjoyment of close interpersonal bonds, leadership roles, and assertiveness, have been related to vulnerability and persistence of depression (18). The cognitive vulnerability theory postulates that childhood maltreatment contributes to vulnerability to depression through a general negative attributional style (19, 20).

The mechanism through which childhood maltreatment attributes to an adverse course of depressive and anxiety disorders in adulthood is still in need of comprehensive studies. This prospective study describes a large sample of adults with depressive and/or anxiety disorders, followed over a 4-year time period. We simultaneously investigated personality domains, cognitive reactivity styles, and psychosocial factors in relation to childhood maltreatment. The purpose of this study was to increase our understanding of the complex interplay between childhood maltreatment and personality characteristics in determining the chance of remission of depressive and anxiety disorders.

The following research questions were addressed: a) do maltreated individuals differ on baseline personality domains, cognitive reactivity styles, and psychosocial factors from non-maltreated individuals who did not experience maltreatment, and b) are personality characteristics important factors in mediating the unfavourable 4-year course of depressive and anxiety disorders, in patients with a history of childhood maltreatment?

Materials and methods

Sample

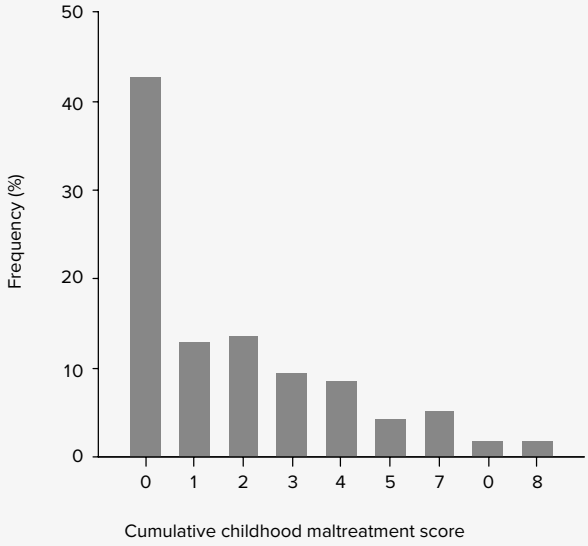
Data were derived from a longitudinal cohort study including 2,981 participants, aged 18-65 years: the Netherlands Study of Depression and Anxiety (NESDA). Participants were recruited through different settings (general population, primary care, and mental health care) and in different phases of illness. The sample consisted of 1,701 persons with a current diagnosis of depression and/or anxiety disorder, 907 persons with life-time diagnoses or at risk because of a family history or subthreshold depressive or anxiety symptoms, and 373 healthy controls. At baseline, lifetime presence of depressive (i.e., major depressive disorder, dysthymia) and anxiety disorders (i.e., panic disorder, agoraphobia, social phobia, generalized anxiety disorder) were diagnosed using the Composite International Diagnostic Interview (CIDI; version 2.1), a fully structured diagnostic interview (21). Study design, rationale, and methods have been reported elsewhere (22).

The present study reports data from the baseline, 2-year and 4-year follow-up assessments of 1,474 (49.4%) participants of the NESDA study, who had a depressive and/or anxiety disorder within the 6 months preceding the study and participated in the 2 or 4 year follow-up. The participants were recruited from the general population (9.3%), primary care (43.8%), and specialised mental care (46.9%). The response rate at 2 and 4 year follow-up was 83.4% and 75.9%, respectively. Non-response was associated with significantly fewer years of education ($P<0.001$), more adverse life events ($P=0.002$), and smaller social network size ($P=0.003$), but not with age, gender or reported childhood maltreatment.

Assessment of childhood maltreatment

At baseline, childhood maltreatment was assessed retrospectively with the NEMESIS Childhood Trauma Interview (CTI), focusing on four domains of childhood maltreatment prior to the age of 16 years (1, 23). Emotional neglect included lack of parental attention or support and ignorance of one's problems and experiences. Psychological abuse was defined as verbal abuse, undeserved punishment, and blackmail. Physical abuse was defined as being kicked or hit with hands or an object, beaten up or any other physical abuse. Sexual abuse was defined as being sexually approached against their will, meaning being touched or having to touch someone in a sexual way. Participants were asked to score the frequency on a five-point scale (i.e., once, sometimes, regularly, often and very often). The frequencies were divided into three groups: no childhood maltreatment, mild childhood maltreatment defined as once or sometimes (in at least one domain), and severe childhood maltreatment defined as regularly, often and very often (in at least one domain). A cumulative childhood maltreatment score, defined as the sum scores ranging from 0-8, was created with a higher score indicating more types and a higher frequency of childhood maltreatment (Figure 1) (1).

Figure 1. Distribution of the cumulative childhood maltreatment score.



The CTI is a reliable and valid method for assessment of multiple dimensions of childhood maltreatment (1). The CTI was conducted by specially trained clinical staff and positioned halfway through the 4-hour baseline assessment.

Adult psychosocial and personality characteristics

Socioeconomic context. Adverse life events, at any time in the preceding 12 months before baseline, were assessed as a sum of 12 possible events measured by the List of Threatening Experiences (LTE) (24). The presence of a partner at baseline and up to two close friends (first and second confident) at baseline was assessed using the Close Person Inventory (25). Social network size was measured by the total number of important relatives, friends and others with whom the participants had regular contact (from 1 to >20) (25). Feelings of loneliness were assessed by using the Loneliness Scale, an 11-item questionnaire consisting of the emotional loneliness subscale and the social loneliness subscale (26). The score ranges from 0 to 11 points, with higher scores being indicative of higher loneliness levels. Participants with a paid job of >8 h per week were considered to be employed versus participants being unemployed (<8 h per week or without a job). The household income was determined with 24 categories, from < 500 up to 5000 Euro's per month. A continuous variable was created, based on the mean of the applicable income category.

Personality was operationalized using the Neuroticism–Extroversion–Openness Five Factor Inventory (NEO-FFI), a 60-item self-report questionnaire measuring the 'big 5' personality domains: neuroticism, extraversion, agreeableness, conscientiousness, and openness to experience (27). Each domain consists of 12 items. Scoring for each item ranged from 1 (totally disagree) to 5 (totally agree). External locus of control reflects the extent to which individuals feel they are not able to control or influence outcomes, and assessed by the 5-item Mastery Scale (28). Scoring for each item ranged from 1 (strongly disagree) to 5 (strongly agree), resulting in an overall score of 5 to 25, with higher scores indicating greater external locus of control.

Cognitive vulnerability. The Leiden Index of Depression Sensitivity-Revised (LEIDS-R) is a 34-item self-report questionnaire that measures cognitive reactivity in response to low mood (29). Participants were asked to indicate the degree to which a list of statements would reflect their cognitions and behaviors in response to sad mood – for example, "When I feel sad, I feel more hopeless about everything" (hopelessness); When I feel sad, I spend sad, I spend more time thinking about the possible causes of my moods" (rumination). Scoring for each question ranged from 1 (not applicable) to 5 (very strongly applicable). For this study, we only used the subscales hopelessness and rumination.

4-year chronicity of depressive and/or anxiety disorders

At the 2-year and 4-year follow-up assessment, the CIDI and life chart were repeated to determine the course of depressive and anxiety disorders (30). Using a calendar method, life events were recalled to refresh memory, after which the presence and severity of symptoms of depression and anxiety were determined. We have LCI information on the years between baseline and 4-year follow-up. For each month with reported symptoms during the 4-year follow up, severity of symptoms was assessed ranging from none or minimal severity to mild, moderate, and severe or very severe. Symptoms on the LCI were only considered to be present when at least of mild severity. Remission of depressive and anxiety disorders was defined as absence of both depressive and anxiety symptoms during 3 consecutive months, based on the LCI. We calculated the 'time to remission' of depressive disorders and 'time to remission' of anxiety disorders in months (minimum of 4 and maximum of 64 months), from baseline until the 4-year follow-up. 'Time to remission' of participants, not reaching the remission status during the 4-year follow-up (35.3%) or who did not participate between 2 and 4 years follow-up, was censored at the latest available assessment time. Subsequently, we also analyzed the 'time to remission' of depressive disorders or 'time to remission' of anxiety disorders separately, to explore whether the impact of childhood maltreatment differed for the remission of depressive versus anxiety disorders.

Statistical Analyses

We used descriptive statistics to describe socioeconomic, psychosocial, and personality characteristics. Linear regression analysis was used to test whether all of the above characteristics were associated with specific domains of childhood maltreatment. Demographic data were gender, age, and years of education attained. Since gender, age, and years of education were significantly associated with childhood maltreatment, we included these demographic variables as covariates. Univariate and multivariate Cox regression analyses were used to examine the associations between the childhood maltreatment domains and 'time to remission' of a depressive and/or anxiety disorder. After adjusting for age, gender, and education (Model 1), all childhood maltreatment domains were included in one model (Model 2) to yield the independent predictors for 4-year remission of anxiety and depressive disorders. In addition, Cox regression analysis was performed with the cumulative childhood maltreatment score, adjusted for age, gender, and education (Model 1). Cox regression analyses yielded hazard ratios with 95% confidence intervals and accompanying *P*-values. To determine whether personality characteristics mediated the associations found between childhood maltreatment and the 4-year remission of depressive and anxiety disorders, we used the indirect method by Preacher and Hayes (31). The indirect method estimates the total, direct, and indirect unstandardized effects of the independent variable on the dependent variable through the mediator variable, controlling for covariates. The 95% percentile-based confidence intervals (CI) were computed using the cut-offs for the 2.5% highest and lowest scores of the empirical distribution. A two-tailed $P < 0.05$ was considered statistically significant. The statistical software used was SPSS 22.0 (SPSS Inc., Chicago, IL, USA).

Results

Socioeconomic, psychosocial, and personality characteristics and childhood maltreatment

Sample characteristics at baseline are listed in Table 1. Sixty-seven percent of the participants were female, mean age was 41.6 years, and mean level of education was 11.9 years. At baseline, 57.4% (n=846) of the participants reported childhood maltreatment, of which 20.2% (n=298) classified as mild and 37.2% (n=548) as severe. All sociodemographic and psychosocial variables (except for having friends) were significantly associated with the severity of the childhood maltreatment status. All personality characteristics were strongly associated with the severity of the childhood maltreatment status ($P < 0.001$).

Table 1. Socioeconomic, psychosocial and personality characteristics in 1,474 participants with depressive and/or anxiety disorders according to childhood maltreatment status.

	Mean (SD) or %	No childhood maltreatment (n=628)	Mild childhood maltreatment (n=298)	Severe childhood maltreatment (n=548)	*P*-value
Socioeconomic characteristics:					
Age (years)	41.6 ± 12.3	39.9 ± 12.6	41.6 ± 11.9	43.4 ± 11.8	<0.001
Female gender	67.0%	61.0%	68.5%	73.0%	<0.001
Education level attained (years)	11.9 ± 3.3	12.0 ± 3.2	12.2 ± 3.4	11.6 ± 3.3	0.02
Household income (×1,000 euro)	2.2 ± 1.5	2.2 ± 1.5	2.2 ± 1.6	2.0 ± 1.5	0.05
Unemployed	46.7%	42.2%	44.6%	53.1%	<0.001
Psychosocial characteristics:					
Social network size	2.6 ± 1.0	7.4 ± 6.0	6.2 ± 5.2	5.2 ± 4.2	<0.001
Partner present	63.8%	68.2%	62.7%	61.4%	0.02
Friend(s) present	75.5%	79.1%	72.2%	75.2%	0.10
Loneliness	4.8 ± 4.4	4.2 ± 4.2	4.8 ± 4.4	5.6 ± 4.5	<0.001
No. of adverse life events	1.0 ± 1.2	0.9 ± 1.1	1.0 ± 1.2	1.1 ± 1.2	0.008
Personality characteristics (NEO–FFI):					
Neuroticism	41.0 ± 7.1.	39.2 ± 6.8	41.6 ± 7.4	42.8 ± 6.8	<0.001
Extraversion	34.3 ± 6.8	35.7 ± 6.6	33.7 ± 6.4	32.9 ± 7.0	<0.001
Openness	38.3 ± 6.2	37.7 ± 6.2	38.4 ± 6.2	38.9 ± 6.1	<0.001
Agreeableness	43.1 ± 5.4	43.7 ± 5.2	43.1 ± 5.3	42.4 ± 5.5	<0.001
Conscientiousness	39.9 ± 6.6	40.9 ± 6.5	39.2 ± 6.8	39.0 ± 6.3	<0.001
LEIDS Rumination	4.8 ± 4.7	4.8 ± 4.7	5.8 ± 4.8	6.8 ± 5.7	<0.001
LEIDS Hopelessness/suicidality	9.2 ± 5.7	9.2 ± 5.7	9.8 ± 5.8	10.8 ± 6.1	<0.001
External locus of control	13.2 ± 6.7	12.0. ± 6.6	13.7 ± 6.6	14.0 ± 6.7	<0.001

Plus–minus values are means ± SD

Table 2 summarizes the socioeconomic, psychosocial, and personality characteristics of the study sample, according to specific domains of childhood maltreatment and cumulative childhood maltreatment score. Linear regression analysis showed a significant association of emotional neglect and psychological abuse with all socioeconomic and psychosocial variables, except for unemployment (P <0.05). Sexual abuse was the domain the least strongly associated (only for social network size and loneliness). The cumulative childhood maltreatment score was associated with all socioeconomic and psychosocial variables: a higher childhood maltreatment score was associated with being older, being female, having a lower level of education, having a lower household income, being unemployed, having a smaller social network size, not having a partner/friends, experiencing increased loneliness, and having a higher number of adverse life events. Emotional neglect and psychological abuse were associated with all personality characteristics in detrimental directions (P values <0.05), whereas physical and sexual abuse only predicted for neuroticism, openness, rumination, hopelessness and external locus of control (P values <0.05). The childhood

maltreatment score corresponded with more unfavorable personality characteristics and cognitive reactivity styles. In other words, lower levels of extraversion, agreeableness, conscientiousness and higher levels of neuroticism, openness, hopelessness, rumination and external locus of control were highly associated with the level of reported childhood maltreatment (*P* <0.001).

Table 2. Socioeconomic, psychosocial and personality characteristics in 1,474 participants with depressive and/or anxiety disorders according to childhood maltreatment domains and childhood maltreatment score.

	Emotional neglect	Psychological abuse	Physical abuse	Sexual abuse	Childhood maltreatment score
Socioeconomic characteristics:					
Age (years)	0.145**	0.097**	0.057*	0.046	0.124**
Female gender	0.070*	0.077*	0.046	0.205**	0.135**
Education level attained (years)	0.004	-0.063*	-0.091**	-0.106*	-0.082*
Household income (×1,000 euro)	-0.072*	-0.061*	-0.057*	-0.020	-0.074*
Unemployed	0.069	0.048	0.068	0.045	0.080*
Psychosocial characteristics:					
Social network size	-0.194**	-0.141**	-0.085*	-0.083*	-0.180**
Partner present	-0.101**	-0.082*	-0.001	-0.004	-0.071*
Friend(s) present	-0.068*	-0.050*	-0.007	-0.004	-0.048*
Loneliness	0.133**	0.124**	0.078*	0.069*	0.143**
No. of adverse life events	0.071*	0.077*	0.100**	0.025	0.093**
Personality characteristics (NEO–FFI):					
Neuroticism	0.239**	0.195**	0.134**	0.082*	0.231**
Extraversion	-0.197**	-0.128**	-0.055*	-0.041	-0.153**
Openness	0.116**	0.071*	0.065*	0.099**	0.111**
Agreeableness	-0.154**	-0.162**	-0.135**	-0.023	-0.131**
Conscientiousness	-0.154**	-0.055*	-0.050	-0.059*	-0.114**
LEIDS Rumination	0.112**	0.101**	0.083*	0.079*	0.129**
LEIDS Hopelessness/suicidality	0.181**	0.180**	0.120**	0.097**	0.205**
External locus of control	0.157**	0.135**	0.122**	0.052*	0.163**

Linear regression analysis yielded beta-coefficients adjusted for age, gender, and education.
*: *P* <0.05, **: *P* <0.001

Impact of childhood maltreatment on remission of depression and anxiety

Table 3 shows the association between the domains of childhood maltreatment and remission of depressive and anxiety disorders during the 4-year follow-up. Multivariate regression analyses, adjusted for age, gender, and education (Model 1), showed that emotional neglect and psychological abuse were negatively associated with the 4-year remission of depressive and anxiety disorders. In addition, multivariate analyses were conducted, in which emotional neglect and psychological, physical, and sexual abuse were

entered simultaneously to investigate which domains were independent predictors (Model 2). Emotional neglect was the only significant independent predictor of the 4-year remission for depressive and/or anxiety disorder (*P* =0.001).

The cumulative childhood maltreatment score, adjusted for age, gender, and education score predicted the 4-year remission for depressive and/or anxiety disorder as well (*P* <0.001). To determine the impact of childhood maltreatment on the course of either depressive or anxiety disorders, we performed the analyses for the 4-year remission of depressive and 4-year remission of anxiety disorders separately. The childhood maltreatment score, adjusted for age, gender, and education was similarly predictive of the 4-year remission of depressive disorders (HR=0.94, 95% CI [0.91-0.97], *P* <0.001) and anxiety disorders (HR=0.96, 95% CI [0.92-0.99], *P* =0.02).

Table 3. Chance of remission of depressive and anxiety disorders according to childhood maltreatment during 4 years of follow-up.

Emotional neglect:	**No**	**Mild**	**Severe**	***P*-value for trend**
No. of patients	766	316	392	
Crude	1.0 (Ref.)	0.87 (0.74-1.03)	0.66 (0.56-0.78)	< 0.001
Model 1	1.0 (Ref.)	0.88 (0.74-1.04)	0.69 (0.58-0.81)	< 0.001
Model 2	1.0 (Ref.)	0.90 (0.75-1.08)	0.71 (0.57-0.88)	0.001
Psychological abuse:	**No**	**Mild**	**Severe**	***P*-value for trend**
No. of patients	1011	257	206	
Crude	1.0 (Ref.)	0.80 (0.67-0.96)	0.73 (0.59-0.91)	0.001
Model 1	1.0 (Ref.)	0.82 (0.69-0.99)	0.76 (0.61-0.94)	0.003
Model 2	1.0 (Ref.)	0.93 (0.75-1.16)	0.92 (0.69-1.21)	0.42
Physical abuse:	**No**	**Mild**	**Severe**	***P*-value for trend**
No. of patients	1217	115	142	
Crude	1.0 (Ref.)	0.78 (0.61-1.02)	0.88 (0.70-1.11)	0.10
Model 1	1.0 (Ref.)	0.78 (0.60-1.02)	0.92 (0.73-1.17)	0.26
Model 2	1.0 (Ref.)	0.95 (0.71-1.26)	1.18 (0.89-1.58)	0.34
Sexual abuse:	**No**	**Mild**	**Severe**	***P*-value for trend**
No. of patients	1156	126	192	
Crude	1.0 (Ref.)	1.07 (0.85-1.36)	0.82 (0.67-1.01)	0.12
Model 1	1.0 (Ref.)	1.05 (0.83-1.32)	0.83 (0.67-1.03)	0.14
Model 2	1.0 (Ref.)	1.08 (0.85-1.36)	0.91 (0.73-1.13)	0.52
		Childhood maltreatment score (continuous):		
Crude		0.93 (0.90-0.96)		< 0.001
Model 1		0.94 (0.91-0.97)		< 0.001

Data are hazard ratio's (95% confidence intervals).
Model 1: adjusted for age, gender, level of education.
Model 2: adjusted for age, gender, level of education and emotional neglect, psychological abuse, physical abuse and sexual abuse.

Potential mediating factors between childhood maltreatment and remission of depression and anxiety

We analyzed whether the relationship between childhood maltreatment score (IV) and 4-year remission of depressive and anxiety disorders (DV) could be explained by personality characteristics as mediating variables (M). Table 4 presents the results of mediation analyses, which confirmed that the childhood maltreatment score is associated with all personality characteristics (a) and that most of these personality characteristics are associated with 4-year remission of depressive and anxiety disorders (b). All personality variables, except openness and agreeableness, showed significant indirect effects (a * b effects) in univariate regression analyses. In multivariate regression analyses, the indirect effects (a * b effects) remained significant for neuroticism, extraversion, hopelessness, and external locus of control. In the multivariate model, the direct effect (c') between childhood maltreatment and 4-year remission of depressive and/or anxiety disorders was no longer statistically significant (0.044 of total effect, approximately 40%). Nevertheless, this mediation model suggests that there is an overall effect of childhood maltreatment on the 4-year remission of depressive and/or anxiety disorders, with neuroticism, extraversion, hopelessness, and external locus of control mediating the associations.

Table 4. Mediation analysis of personality characteristics on the relationship between childhood maltreatment score (IV) and remission of anxiety and/or depression within 4-years (DV) in participants with a baseline diagnosis of depressive or anxiety disorder (N=1,474).

Mediating variable (M)	Effect of maltreatment on M	Effect of M on DV (b)	Indirect effect[a] (a x b; 95% CI)	Direct effect of trauma on DV (c')	Total effect (c)
Neuroticism	0.698**	-0.060**	**-0.042 (-0.061; -0.028)**	-0.064*	-0.111**
Extraversion	-0.497**	-0.060**	**-0.030 (-0.044; -0.018)**	-0.077*	-0.111**
Openness	0.259*	0.005	0.001 (-0.004; 0.007)	-0.105*	-0.111**
Agreeableness	-0.355**	0.004	-0.001 (-0.009; 0.007)	-0.100*	-0.111**
Conscientiousness	-0.249*	0.033*	**-0.008 (-0.017; -0.003)**	-0.093*	-0.111**
LEIDS hopelessness	0.457**	-0.057**	**-0.026 (-0.040; -0.015)**	-0.082*	-0.111**
LEIDS rumination	0.336**	-0.030*	**-0.010 (-0.021; -0.003)**	-0.096*	-0.111**
Mastery scale	-0.465**	0.032*	**-0.015 (-0.026; -0.006)**	-0.091*	-0.111**
All mediating variables combined					
Neuroticism	0.694**	-0.026*	**-0.018 (-0.035; -0.002)**	-0.044	-0.111**
Extraversion	-0.496**	0.035**	**-0.017 (-0.032; -0.007)**		
Conscientiousness	-0.249*	0.001	0.000 (-0.007; 0.005)		
LEIDS hopelessness	0.457**	-0.033*	**-0.015 (-0.033; -0.001)**		
LEIDS rumination	0.335**	0.001	0.001 (-0.012; 0.012)		
External locus of control	0.469**	0.024*	**-0.011 (-0.023; -0.001)**		

[a] Indirect effects were considered to be significant when the bias-corrected and accelerated confidence interval did not include zero (indicated in bold).
Abbreviations: a =effect of IV on M, b = effect of M on DV, a x b = indirect effect, c = total effect, c' = direct effect, DV = dependent variable, IV = independent variable, M = mediating variable.
*: P <0.05, **: P <0.001

Discussion

Our results demonstrated that, in a large sample of adults with depressive and/or anxiety disorders, childhood maltreatment has a negative impact on socioeconomic and psychosocial factors in adulthood. Childhood maltreatment is associated with lower levels of extraversion, agreeableness, and conscientiousness, and higher levels of neuroticism, openness, hopelessness, rumination, and external locus of control. Childhood maltreatment, i.e. emotional neglect, was a strong independent predictor of poor remission of depressive and/or anxiety disorders during the 4-year follow-up. Personality characteristics, such as higher levels of neuroticism, hopelessness, and external locus of control and lower levels of extraversion, appear to have a strong mediating effect on the relationship between childhood maltreatment and 4-year remission of depressive and/or anxiety disorders.

Adult psychosocial and personality characteristics in relation to childhood maltreatment
Our socioeconomic results concur with prior findings associating childhood maltreatment with lower levels of education, substantial income loss, and significant loss of adult economic productivity (6-8). Childhood maltreatment has been frequently correlated with difficulties in the interpersonal domain (4, 5, 32). We extend these data by documenting the specific effect of the four domains of maltreatment. Analyzing the differential effects, we found emotional neglect and psychological abuse to have the largest impact on social network size, loneliness, and presence of a partner and friends. Furthermore, we found that physical abuse and sexual abuse in childhood have enduring psychosocial effects in adulthood. In agreement with the 'stress generation model' (9, 10), childhood maltreatment is associated with a higher number of adverse life events in adulthood. Childhood maltreatment increases the likelihood of experiencing adult life events (e.g. divorce, separation of long-term friendships, violence) and contribute to the ongoing cycle of revictimization.

Childhood maltreatment has been postulated as an important determinant of neuroticism (33) and has consistently been associated with high levels of neuroticism (12-16). In line with previous studies, emotional neglect and psychological abuse were the most pervasively related to the 'big 5' personality domains, whereas physical and sexual abuse were only associated with neuroticism and openness (13, 15, 16). In addition, we found that all domains of childhood maltreatment were associated with increased cognitive vulnerability and increased external locus of control. We therefore speculate that neuroticism, a negative cognitive style and an external locus of control might act as distal vulnerability factors, in patients with childhood maltreatment.

Mediation model between childhood maltreatment and remission of depression and anxiety
Several prospective studies have linked childhood maltreatment to an unfavourable illness course characterized by less recovery, longer duration of symptoms, and chronicity (1, 2). We found that the childhood maltreatment score was also a significant predictor of remission of depressive disorders and, separately, of remission of anxiety disorders. This finding justified our decision to perform mediation analyses on the remission of both depression and anxiety symptoms.

This study investigates the possible mediating role of personality characteristics in the association between childhood maltreatment and the course of depressive and anxiety disorders in adults. After all potential mediating variables were added into the model, we provided new evidence that high levels of neuroticism, hopelessness and external locus of control, and low levels of extraversion significantly mediate the association between childhood maltreatment and remission of depressive and anxiety disorders. This mediation model assumes a causal chain in which: (a) exposure to childhood maltreatment influences personality characteristics and (b) personality characteristics influence the chances of remission of depressive and/or anxiety disorders. Since personality characteristics reflect relatively enduring characteristics of the individual, our findings might be consistent with the hypothesis that personality characteristics mediate the association between childhood maltreatment and remission of depressive and anxiety disorders. We speculate that our results are suggestive of prevailing strong mediating effects of personality characteristics on the association between childhood maltreatment and remission rates.

The strength of this study is the prospective design; the large sample of midlife participants with a baseline diagnosis of depressive and/or anxiety disorder; the use of both structured interviews and standardized self-report questionnaires; simultaneous consideration of all domains of childhood maltreatment, key psychosocial measures, and personality dimensions; and the use of a mediation model to investigate the predictive value of personality variables on illness course. Methodological limitations include the retrospective assessment of childhood maltreatment at baseline, although recall of childhood maltreatment does not seem to be critically affected by current mood state (34). Common source bias may have been a potential problem, as both personality and childhood maltreatment were measured at the same time and retrospectively. Measures of personality, based on limited self-reports, cannot portray a wide enough range of all traits to cover the potential consequences of the complexities of upbringing. Moreover, as our participants were having current depressive and/or anxiety disorders, personality measurements may be contaminated with ‘state’ effects. However, traits such as neuroticism are stable, pervasive, and influential and consistently emerge in many analyses (35). Remission of depressive and anxiety disorders during the 4-year follow-up was based on the LCI, determining the presence and severity of symptoms of depression and anxiety, instead of a CIDI diagnosis.

In conclusion, we found that childhood maltreatment, especially emotional neglect and psychological abuse, was associated with more psychosocial impairment in adulthood. Childhood maltreatment was associated with more unfavorable personality characteristics and coping styles. Personality characteristics, such as high levels of neuroticism, hopelessness and external locus of control, and low levels of extraversion are important independent predictors on the relationship between childhood maltreatment and 4-year remission of depressive and anxiety disorders. A maladaptive personality profile may be one mechanism linking childhood maltreatment to an adverse illness course of depressive and anxiety disorders. Emphasis on specific interventions, focused on neuroticism, extraversion, and locus of control, can contribute to a better prognosis in a 'high risk' group of depressive and anxiety disorders.

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