

**Childhood Trauma and Depression in Offspring of Psychiatric Patients, and the Role of
Parental Support**



Maxime Roerhorst

Universiteit Utrecht

Student number: 6225977
Course: Master Thesis Clinical Psychology (201500819)
Supervisor: L. Boschloo
Date: 01-07-2022
Word count: 4995

Abstract

Introduction: Adolescent and young adult offspring of patients with a psychiatric disorder are at ultra-high risk to develop depression themselves, and childhood trauma may act as an additional risk factor. The aim of this study was to establish the association between one or multiple types of childhood trauma and depressive symptoms in this high-risk group and to assess whether this association is weaker for offspring who experience parental support.

Method: The sample consisted of 518 offspring of patients with an anxiety and/or depressive disorder who participated in the baseline assessment of the Adolescents at Risk of Anxiety and Depression: Neurobiological and Epidemiological approach (ARIADNE) study. The DSM-IV Questionnaire was used to assess depressive symptoms, the Composite International Diagnostic Interview (CIDI) to establish childhood trauma and the Social Support Questionnaire (SSQ) to determine experienced parental support. A hierarchical linear regression was performed to examine the association between childhood trauma and severity of depressive symptomatology, and a moderation analysis to assess the role of parental support in this association.

Results: Experiencing childhood trauma is associated with more depressive symptoms in adolescence and young adulthood, and this association did not differ for one or multiple types of trauma when adjusted for anxiety. Parental support did not moderate this association.

Discussion: Experiencing childhood trauma is associated with more depressive symptoms in adolescent and young adult offspring of patients with a psychiatric disorder, and this association was not moderated by the level of experienced parental support. Future longitudinal research is needed to examine the course of the development of depressive symptoms after experiencing childhood trauma, and to assess the role of anxiety disorders in this association.

Key words: ARIADNE, COPMI, depression, childhood trauma, parental support

Childhood Trauma and Depression in Offspring of Psychiatric Patients, and the Role of Parental Support

Depression is a common psychiatric disorder with several outcomes for mental health and wellbeing (Smith, 2014) and is characterized by a depressed mood or diminished interest or pleasure in almost all activities (American Psychiatric Association [APA], 2013). Additional symptoms include fatigue, loss of appetite, changes in weight, feelings of worthlessness and concentration problems (Zimmerman et al., 2015). The prevalence rates of depression in Europe range from 5.2% to 22.3% (Kessler et al., 2009). Of all patients diagnosed with depression, 56-85% reports clinically severe impairment of life (Rapaport et al., 2005) and 8.8% a previous suicide attempt (Hasin et al., 2005). In addition, subthreshold depression, in which individuals suffer from depressive symptoms but do not meet the criteria for a depressive disorder, is a highly prevalent condition which also impacts the wellbeing (Cuijpers & Smit, 2004). Adolescence and young adulthood are critical periods for the onset of depression (Kessler et al., 2005) and especially such an early-onset depression is related to more severe outcomes, including high relapse rates and the development of a range of comorbid psychiatric disorders in adulthood (Smith & Blackwood, 2004; Thapar et al., 2012). In sum, because depression is a common disorder with especially severe outcomes for adolescents and young adults, it is important to conduct research on the development and prevention of depression in this stage of life.

Depression in offspring of patients diagnosed with a psychiatric disorder

Several studies have shown that offspring of patients diagnosed with a psychiatric disorder are at elevated risk of developing a depression themselves (Paananen, 2021; Rasic et al., 2014; Vandeleur et al., 2012). For example, Weissman and colleagues (2016) found that offspring of depressed patients had a threefold risk of developing a depression compared to offspring of nondepressed patients, and although this risk stayed elevated after thirty years of

follow-up, adolescence and young adulthood were the most vulnerable stages. In addition, world wide's largest research of offspring of patients who received specialized treatment for a mood or anxiety disorder, the Adolescents at Risk of Anxiety and Depression:

Neurobiological and Epidemiological approach study (ARIADNE), established that two-thirds of offspring developed a depressive or anxiety disorder before the age of thirty years, of which depression was the most prevalent disorder (Havinga et al., 2017). Again, incidence rates start to increase at ten and continue to be high throughout adolescence and young adulthood. As these offspring are an ultra-high-risk group for depression, it is important to improve the understanding of the mechanisms underlying the onset of depression.

Childhood trauma and the development of depression

Besides having a parent diagnosed with a psychiatric disorder, several studies report that childhood trauma also increases the risk of depressive symptoms (Chen et al., 2021; Marshall et al., 2017). Several types of childhood trauma, including bullying, exposure to war, childhood maltreatment and domestic or community violence, predict depressive symptoms in adolescents and adults in general population, and in more than one-third of the cases these symptoms were severe enough to classify a depressive disorder (Dantchev et al., 2019; Hayashi et al., 2015; Klasen et al., 2010; Paterniti et al., 2017). Besides, childhood trauma is associated with more severe symptoms, a chronic course and a lack of response or remission during treatment (Angelakis & Gooding, 2022; Klein et al., 2009; Nanni et al., 2012). A study based on the above-mentioned ARIANDE sample established the association of childhood trauma and the classification of a mood disorder within offspring of patients diagnosed with a psychiatric disorder (Havinga et al., 2017). However, this study did not differentiate in the number of experienced trauma types and the severity of depressive symptoms, which is unfortunate since studies in general population found a dose-dependent relationship for this association (Chapman et al., 2004). Besides, the study assessed mood

disorders in general and did not adjust for anxiety disorders, which is relevant since anxiety and depression are highly comorbid disorders (Axelson & Birmaher, 2001). Since childhood trauma may act as an additional risk factor for depression on the already high risk these offspring face, it is important to assess whether there is a dose-dependent association between trauma and depression in this high-risk group when adjusted for anxiety disorders and investigate potential factors that influence this association.

Parental support

Parental support seems to buffer the role of childhood trauma in the development of depression in general population (El-Khodary & Samara, 2019; Godbout et al., 2014). However, there are indications that offspring of patients diagnosed with a psychiatric disorder experience less parental support after a trauma than offspring of non-psychiatric parents (Hovens et al., 2010). For example, trauma of offspring causes more stress in a depressed parent than a nondepressed parent, which in turn influences the parent-child relationship, including parental support, in a negative manner (Farmer et al., 2011; Salloum et al., 2014). These are important findings since they indicate that parental support is a potential mechanism that can be addressed in preventive treatments for depression in offspring of psychiatric patients after experiencing childhood trauma. However, to my knowledge, no previous study established the buffer effect of parental support in offspring of patients diagnosed with a psychiatric disorder. It is highly relevant to explore whether parental support moderates the association between childhood trauma and depressive symptoms in this high-risk group, to determine whether preventive treatments based on this mechanism could be beneficial.

Current study

The aim of the current thesis is to establish the association between childhood trauma and depressive symptoms in adolescent and young adult offspring of patients diagnosed with

a psychiatric disorder, and to adjust for anxiety disorders. A second aim is to address the moderating role of parental support in this association. To investigate this, data from the above-mentioned world wide's largest offspring research (ARIADNE; Havinga et al., 2017) are used. The sample of the ARIADNE study included 522 offspring of 366 patients who were diagnosed with depression or anxiety and received specialized treatment in one of sixteen mental health institutes in the northern parts of the Netherlands. In the current study, it is expected that experiencing childhood trauma is associated with depressive symptoms, and that the experience of multiple types of trauma is associated with more severe symptoms than the experience of one type of trauma (*hypothesis 1*). Besides, it is expected that parental support moderates this association; that is, childhood trauma is more weakly related to depressive symptoms in offspring who experience parental support than in offspring who experience no parental support (*hypothesis 2*).

Methods

Study design and participants

The current study uses baseline data of the observational cohort study ARIADNE (Havinga et al., 2017). This cohort study included 522 offspring (57.3% girls; aged between 13-16 years) of 366 patients who were diagnosed with depression (including major depressive disorder and dysthymia) and/or anxiety disorder (including obsessive compulsive disorder and panic disorder with or without agoraphobia) at their mental health institute and received specialized treatment for their disorder. Recruitment took place between 2000-2002 via the parents of the offspring (the patients) and is illustrated in Figure 1. Patients were recruited in the northern parts of the Netherlands, through mental health services where they received their specialized treatment. Patients and their offspring were not able to participate if the patient had a history of schizophrenia, schizoaffective disorder, or posttraumatic-stress disorder, or if the patient had insufficient command of the Dutch language. Information about

the study was mailed to 4470 patients who were at least once treated for a depressive or anxiety disorder. They were asked to confer with their biological children (aged between 13 and 26 years old) about participation.

In the ARIADNE study, patients and their offspring were interviewed with the Composite International Diagnostic Interview (CIDI; Kessler & Üstün, 2004), to establish depressive and anxiety disorders. Of the patients, 138 (37.7%) suffered from depression, 25 (6.8%) from anxiety disorder, and 183 (50.0%) from comorbid depressive and anxiety disorder. No formal diagnosis according to the CIDI was present in 20 (5.5%) patients. Except one, all these patients passed the screener questions of the CIDI, indicating that they were suffering from subclinical depressive and/or anxiety symptoms. In addition, participants filled in several questionnaires, such as the DSM-IV questionnaire (Hartman et al., 2003) and the Social Support Questionnaire (SSQ; Sarason et al., 1987).

The ARIADNE study protocol was approved by the Medical Ethics Committee of the University Medical Center Groningen, Groningen, The Netherlands. The current study was approved by the Ethical Review Board of the Faculty of Social and Behavioural Sciences of Utrecht University (reference number: 22-0583). All participants (both patients and their offspring) provided written informed consent.

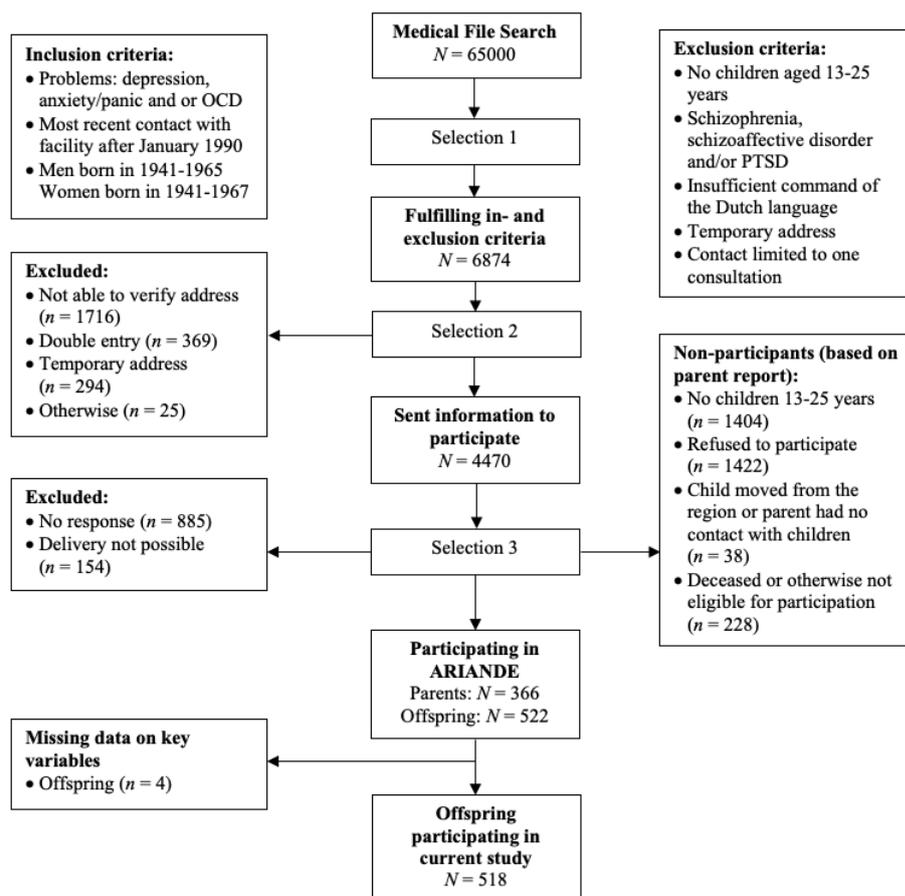


Figure 1. Flowchart of recruitment procedure.

Sample

To determine the minimum sample size of the current study, a power analysis was conducted using G*Power (Faul et al., 2007). Research on similar topics yielded moderate to large effect sizes (Aguilera et al., 2009; Brunstein-Klomek et al., 2007; Spinhoven et al., 2010). To find an association between childhood trauma and depressive symptoms of at least a moderate effect size ($f^2 = .15$, $\alpha = .05$) with a power of 95%, and to assess moderation effects, a sample size of 89 participants was required. The sample of the current study included 518 offspring from the ARIADNE study with complete data on the key variables (i.e., depressive symptoms, traumatic experience, parental support), which is sufficient according to the sample size calculation. The sample included 220 males and 298 females

between 13 and 26 years old ($M = 18.12$; $SD = 3.19$). In 356 offspring (68.7%) the mother was the index parent. The majority of the participants (>95%) was of Dutch origin.

Measures

Depressive symptoms

To assess depressive symptoms, the DSM-IV Questionnaire (Hartman et al., 2003) was used. Items in this self-report questionnaire refer to symptoms as described in the Diagnostic and Statistical Manual of Mental Disorders (4th edition) (DSM-IV) classification system (APA, 1994). The depression scale of the DSM-IV Questionnaire consisted of seventeen items, for example “I am often sad” and “I think about suicide”. Participants were asked to report on a four-point Likert-scale to what extent each symptom accurately described their behavior in the months preceding the assessment (1 “not” to 4 “to a very strong degree”). The total score on the depression scale was calculated by summing up all seventeen individual items of the scale. An advantage of the DSM-IV Questionnaire was that it yields continuous symptom scores, as such also measuring subclinical levels of depression. Besides, the questionnaire has a direct relation to DSM-IV diagnoses. Psychometric properties of the depression scale of the DSM-IV Questionnaire were not available. The internal consistency of the depression scale of the DSM-IV Questionnaire was high ($\alpha = .93$).

Depressive disorder

Depressive disorder in the current study includes the classification of a major depressive disorder, dysthymia, or both. Those classifications were assessed with the Composite International Diagnostic Interview (CIDI; Kessler & Üstün, 2004), which is a diagnostic interview that is used to assess mental disorders according to accepted criteria such as the DSM-IV (APA, 1994). The depression/dysthymic section includes 54 items that refer to the symptoms of these disorders. Examples of items are “In the past twelve months, have you felt empty or depressed almost daily for most of the day for two weeks or more?” and “In

the past twelve months, have you experienced two weeks or more where you lost interest in most things, such as work, hobbies, and other things that you usually enjoy?" By means of computerized algorithms, the CIDI provides a diagnosis of major depressive disorder or dysthymia according to DSM-IV criteria. WHO research has found high interrater reliability and high validity for depression (Wittchen et al., 1991; Wittchen, 1994).

Childhood trauma

To establish the experience of childhood trauma, an adjusted version of the Post Traumatic Stress Disorder (PTSD) section of the CIDI (Kessler & Üstün, 2004) was used. In this section, fourteen items refer to traumas, including exposure to war, physical violence, sexual trauma, and events related to disease or death. Participants had to indicate whether they experienced one or more of these fourteen traumas, which are reported in Table 1 in Appendix A. Examples of items are "Have you ever been the victim of physical violence" and "Have you ever been raped?". Based on how many times participants indicated they experienced a type of trauma, they were classified in three groups: experienced no, one or multiple types of trauma in childhood. Psychometric properties of the PTSD section of the CIDI were not available. The internal consistency of the PTSD section of the CIDI was poor ($\alpha = .49$).

Parental support

To assess perceived parental support SSQ (Sarason et al., 1987) was used. This instrument consists of six items that measure social support. Examples of items are "Whom can you really count on to be dependable when you need help?" and "Who accepts you totally, including both your worst and best points?" Participants report for each item those persons from whom they receive the described support. To establish parental support, it was counted how often participants mentioned their father or mother as providing support. These scores were added to assess parental support. Psychometric properties of the SSQ were not

available. The internal consistency of the SSQ was good for maternal support ($\alpha = .77$) and excellent for paternal support ($\alpha = .84$).

Covariates

To adjust for anxiety disorders on depressive symptoms, several covariates were included: panic disorder, agoraphobia, obsessive compulsive disorder (OCD), social anxiety disorder (SAD), general anxiety disorder (GAD), separation disorder and adult separation disorder. All diagnoses were assessed with the CIDI, which provides a diagnosis by means of computerized algorithms (Kessler & Üstün, 2004). Research has found high test-retest reliability, interrater reliability, and validity for most diagnostic sections (Andrews & Peters, 1998; Wittchen, 1994).

Statistical analyses

Statistical analyses were carried out using IBM Statistical Package for the Social Sciences (SPSS) version 28. A two-stage hierarchical multiple linear regression analysis was performed to establish the association between childhood trauma and depressive symptoms (*hypothesis 1*). Depressive symptoms were the dependent variable and the experience of one or multiple types of trauma were entered at stage one of the regression, by making use of dummy coding. There was adjusted for anxiety disorders by entering these covariates at stage two, and a change of more than 10% in β was considered confounding (Budtz-Jørgensen et al., 2007). The assumptions of normality, outliers, no multicollinearity and normality, linearity and homoscedasticity of residuals were checked. A hierarchical binary logistic regression with depressive disorder as dependent variable was performed as sensitivity analysis, in which the above-mentioned steps were repeated. The assumptions of outliers and no multicollinearity were checked. To assess the moderating role of parental support in the association between childhood trauma and depressive symptoms (*hypothesis 2*) a moderation analysis with PROCESS Macros for SPSS (Hayes, 2022) was performed. The assumptions of

linearity, no multicollinearity, outliers and normality and homoscedasticity of residuals were checked.

Results

Sample characteristics

In the sample of 518 offspring, 153 (29.5%) reported one type of childhood trauma, and 138 (26.6%) multiple types of trauma. All offspring reported at least some depressive symptoms ($M = 28.24$, $SD = 8.71$). In 99 (19.1%) offspring a depressive disorder was diagnosed and 201 (38.8%) suffered from another disorder. An anxiety disorder was present in 14.5% of who reported no trauma, 24.2% of who reported one type of trauma and 36.2% of who reported multiple types of trauma. Table 2 presents the descriptive statistics of the sample.

Table 2.

Sample Descriptive Statistics

Variable	<i>M</i>	<i>SD</i>	Min	Max
Depressive symptoms	28.24	8.71	17.00	59.00
Parental support	8.85	2.89	0.00	12.00
Maternal support	5.03	1.44	0.00	6.00
Paternal support	3.83	2.02	0.00	6.00
Support index parent	4.75	1.66	0.00	6.00
Support non-index parent	4.11	1.98	0.00	6.00
Presence of psychiatric disorder	<i>n</i>	%		
Panic disorder	39	7.5		
Agoraphobia	17	3.3		
OCD	33	6.4		
SAD	38	7.3		

GAD	33	6.4
Separation disorder	21	4.1
Adult separation disorder	20	3.9

Note. $N = 518$.

Association between childhood trauma and depressive symptoms

Hierarchical multiple linear regression

To test whether childhood trauma was associated with more depressive symptoms and to adjust for anxiety disorders (*hypothesis 1*), a hierarchical multiple regression analysis was employed. Prior to conducting the regression, the relevant assumptions of this statistical analysis were tested. Firstly, histograms and boxplots indicated that each variable in the regression was normally distributed, and free from univariate outliers. An examination of the Mahalanobis distance scores indicated no multivariate outliers. Further, the collinearity statistics (i.e., Tolerance and VIF) were all within accepted limits, indicating that the assumption of no multicollinearity was met. Plots of standardized residuals indicated that the assumptions of normality, linearity and homoscedasticity of residuals were met (Allen et al., 2015).

The hierarchical multiple regression revealed that experiencing trauma is associated with depressive symptoms (stage 1), $F, (2, 517) = 13.0, p < .001$ and accounted for 4.8% of the variation in depressive symptoms. There was a significant association between experiencing one type of trauma and depressive symptoms ($\beta = .16, p = <.01$) and between experiencing multiple types of trauma and depressive symptoms ($\beta = .23, p = <.001$). Both can be interpreted as small effects. Even after adjusting for anxiety disorders (stage 2) there was a significant association between experiencing one type of trauma and depressive symptoms ($\beta = .10, p = <.05$) and multiple types of trauma and depressive symptoms ($\beta = .10, p = <.05$). Anxiety disorders were confounders in this association ($>10\%$ decrease in β), and

the effect sizes for one and multiple types of trauma were similar and can be interpreted as small effects. The regression statistics are reported in Table 3.

Table 3.

Summary of Hierarchical Linear Regression Analysis for Traumatic Experiences with Depressive Symptoms

	Unadjusted				Adjusted			
	β	t	p	sr^2	β	t	p	sr^2
Experienced types of trauma								
No	<i>Reference</i>							
One	.16	3.43	<.01	.02	.10	2.30	<.05	.01
Multiple	.23	4.86	<.001	.04	.10	2.21	<.05	.01

Note. $N = 518$

Hierarchical binary logistic regression

A hierarchical binary logistic regression was performed to explore whether experiencing childhood trauma is associated with a depressive disorder, and to adjust for anxiety disorders. Prior to conducting the regression, the relevant assumptions of this statistical analysis were tested. Firstly, no outliers were detected. Further, the collinearity statistics (i.e., Tolerance and VIF) were all within accepted limits, indicating that the assumption of no multicollinearity was met (Allen et al., 2015). The hierarchical binary logistic regression revealed results which were in line with the results of the main analysis (hierarchical multiple linear regression). The regression statistics are reported in Table 4 in Appendix A.

Moderating role of parental support

To test whether the association between experiencing childhood trauma and depressive symptoms is weaker for children who experience parental support (*hypothesis 2*), a moderation analysis with PROCESS Macros for SPSS (Hayes, 2022) was employed. Prior to conducting moderation analysis, the relevant assumptions of this statistical analysis were tested. Firstly, histograms and boxplots indicated that each variable in the analysis was normally distributed, and no outliers were detected. Further, the collinearity statistics (i.e., Tolerance and VIF) were all within accepted limits, indicating that the assumption of no multicollinearity was met. Plots of standardized residuals indicated that the assumptions of normality, linearity and homoscedasticity of residuals were met (Allen et al., 2015).

The moderation analysis revealed that parental support did not significantly moderate the association between experiencing childhood trauma and depressive symptoms, $F(2, 505) = .22, p = .802$. No significant moderation was found for maternal support, paternal support, support from the index parent and support from the non-index parent. The moderations were not different for experiencing one or multiple types of trauma. Table 5 reports the statistics of the moderation analyses.

Table 5.

Summary of Moderation Analyses for Moderating Effect

Parental Support

Variable	F	<i>p</i>
Parental support	.22	.802
Maternal support	.25	.777
Paternal support	1.56	.211
Support index parent	.90	.409
Support non-index parent	1.25	.289

Note. $N = 518$

Discussion

Principal findings

The current thesis was the first to establish the association between childhood trauma and depressive symptoms in adolescent and young adult offspring of patients diagnosed with a psychiatric disorder when controlled for anxiety, and to address the moderating role of parental support in this association. Partly in line with hypothesis 1, the results indicate that experiencing childhood trauma is associated with more depressive symptoms, although this association does not differ for experiencing one or multiple types of trauma when adjusted for anxiety. Contrasting to hypothesis 2, parental support, including support from the father, mother, depressed/anxious parent and other parent, did not moderate the association between experiencing childhood trauma and depressive symptoms.

Childhood trauma and depression

Partly confirming the first hypothesis, experiencing childhood trauma is associated with more depressive symptoms, although there seems no difference in this association in offspring who experienced one or multiple types of trauma when adjusted for anxiety. These findings are in line with previous studies showing that several types of childhood trauma were associated with depression in general population (Mandelli et al., 2015). The results add on to the earlier ARIADNE based study on this association (Havinga et al., 2017) by showing that trauma is still associated with depressive symptoms when taking anxiety into account, and by differentiating between one and multiple types of trauma. Further, the results are in accordance with earlier studies reporting a dose-dependent relationship for the association between trauma and depressive symptoms in general population (Agorastos et al., 2014; Hovens et al., 2010). However, the current study was the first to adjust for anxiety disorders and shows that the dose-dependent relationship in this high-risk group disappears when taking anxiety into account. This might implicate that the dose-dependent relationship can be

explained by anxiety disorders, although another important difference is that earlier studies included only interpersonal trauma and the current study included both interpersonal and non-interpersonal traumas. This is highly relevant, since exposure to interpersonal trauma seems associated with depression severity, whereas exposure to impersonal trauma is not (Fowler et al., 2013). A recommendation for future research is to investigate the mechanisms by which different types of trauma are associated with depression after adjusting for anxiety disorders.

Role of anxiety disorders

Since depression and anxiety are highly comorbid disorders (Tiller, 2013) and earlier research did not take into account the potential confounding role of anxiety disorders (Klein et al., 2009; Russel et al., 2010), the current study adjusted for anxiety disorders to establish the unique association between trauma and depression. There was an enormous decrease in effect size after adjusting for anxiety, which was larger for multiple types of trauma (56.6%) than for one type of trauma (37.7%). Besides, the dose-dependent relationship between trauma and depression disappeared after adjusting for anxiety, which makes sense since anxiety is more prevalent in offspring who report multiple types of trauma (36.2%) compared to offspring who report one type of trauma (24.2%). Several studies report that anxiety is suggested to be a prodromal manifestation of depression (Breier et al., 1985; Fava & Tossani, 2007), which implicates that anxiety and depression are different manifestations of the same construct and cannot be viewed as completely independent disorders (Schoevers et al., 2005). However, since the current thesis is a cross-sectional study, no causal conclusions can be drawn about the course of the development of depressive symptoms. A suggestion for future research is to conduct longitudinal studies to examine the course of the development of depressive symptoms after experiencing childhood trauma, and to assess the role of anxiety disorders in this association.

Parental support after childhood trauma

Rejecting the second hypothesis, the association between childhood trauma and depressive symptoms was similar in offspring who experience parental support compared to offspring who experience no parental support. Although this study is the first to examine this moderation in this high-risk group, these findings seem to contrast with earlier studies that found that parental support serves as a protective factor for psychological distress, including depressive symptoms, after childhood trauma (Godbout et al., 2014). This study differs from the current thesis in that they established parental support in the period directly after the trauma, which might indicate that parental support is helpful at that moment, but not after several years (Sippel et al., 2015). Since the primary source of support of young children are their parents and support from peers increases and becomes more important through adolescence, it might be that the role of parental support becomes less prominent in this life-stage (Hellfeldt et al., 2019). Although parental support seems not to moderate the association between childhood trauma and depressive symptoms, it is possible that parental support mediates the association. For instance, Cohen and Mannarino (1996) report that a child's traumatic experience causes emotional distress in the parents, which in turn has detrimental effects on parental support (Farmer et al., 2011; Salloum et al., 2014). A suggestion for future research is to conduct longitudinal studies in which parental and peer support are measured at several moments after the trauma, and to explore both their moderating and mediating influence.

Clinical implications

The results of the current thesis add on to earlier research showing that offspring of patients with a psychiatric disorder are an ultra-high-risk group for depressive symptoms themselves and confirmed that childhood trauma acts as an additional risk factor for depressive symptoms on the already high risk these children face. This emphasizes the importance to identify this high-risk group and to monitor the potential development of

depressive symptoms. Mental health services of the parents might play a role in in this, for instance by providing psychoeducation about the high risk their offspring face, or to actively involve the offspring in the treatment of their parent.

Important is that more than half of the offspring reported one (29.5%) or multiple types (26.6%) of childhood trauma, which is extremely common compared to prevalence rates in general population, that range from 25.1 to 31.0% (Costello et al., 2002; Witt et al., 2017). Given that it is known that trauma is associated with a lack of treatment response in general population (Angekalkis & Gooding, 2022; Nanni et al., 2012), it is very important to screen for trauma in clinical practice at mental health services to provide these offspring specialized treatment which includes a focus on trauma (Jaworska-Andryszewska & Rybakowski, 2019). For instance, Vitriol and colleagues (2014) report that an intervention that screened for and focused on childhood trauma, and helped patients understand their problems in relation to their trauma was effective in reducing symptoms. Interventions like these might be beneficial for offspring in this high-risk group, although further longitudinal research is needed to assess whether childhood trauma is indeed associated with the same complexity in depression and lack of treatment response as in general population.

Since the results of the current thesis indicate that the association between trauma and depression does not differ for offspring who experience parental support and offspring who don't, prevention programs in this stage of life should take into account other aspects. For instance, studies report that adequate sleep, social relationships, and peer support are of major importance in the aftermath of a childhood trauma (Kendall-Tackett, 2022; Van de Ven, 2020). Although all forms of parental support did not yield significant results, worth noting is that support of the healthy parent yielded higher F-values than support of the depressed/anxious parent. Since many interventions focus on the relationship between offspring and depressed/anxious parent (Chi & Hinshaw, 2002; Murray et al., 2003; Timmer

et al., 2011), a suggestion for future research is to investigate the importance of the relationship between offspring and healthy parent in these interventions.

Strengths and limitations

Worth noting are several strengths of the current study. Specifically, it was the first to establish the association between childhood trauma and depression in this high-risk group when adjusted for anxiety disorders, and to distinguish between one and multiple types of trauma. Besides, the role of parental support in this association was never explored before. Additionally, the data used from the ARIADNE study consisted of a large sample with offspring of patients who were diagnosed with an anxiety or depression and received specialized treatment, and there was a thorough clinical assessment of the patients and their offspring. Furthermore, since the primary outcome measure was depressive symptoms, subclinical levels of depression were assessed as well.

Despite these strengths, the results must be considered in the light of some limitations of which some, such as the timing of the measurement of parental support, are mentioned above. Another limitation is that since the study design was cross-sectional, no causal conclusions can be drawn. For instance, future longitudinal studies are needed to examine whether anxiety disorders might be a prodromal manifestation of depression. An additional limitation is that childhood maltreatment was not included as a type of trauma, although this has consistently been found as predictor of depression in general population (Nelson et al., 2017). A final limitation is that the DSM-IV Questionnaire (Hartman et al., 2003) to assess depressive symptoms was developed for the ARIADNE study and is not validated. However, a sensitivity analysis in which depression was assessed with the CIDI (Kessler & Üstün, 2004) was performed to control for this limitation, which yielded similar results.

Conclusion

In sum, experiencing childhood trauma is associated with more depressive symptoms in adolescent and young adult offspring of patients with a psychiatric disorder, and this association is not weaker for offspring who experience parental support than for offspring who experience no parental support. This emphasizes the importance to identify this high-risk group and to monitor the potential development of depressive symptoms, a process in which mental health practices might play an important role. Future longitudinal research is needed examine the course of the development of depressive symptoms after experiencing childhood trauma, and to assess the role of anxiety disorders in this association. It is recommended to investigate differences in types of trauma and to explore whether parental support might be a protective factor in earlier stages of life.

References

- Agorastos, A., Pittman, J. O. E., Angkaw, A. C., Nievergelt, C. M., Hansen, C. J., Aversa, L. H., Parisi, S. A., Barkauskas, D. A., R, The Marine Resiliency Study Team, & Baker, D. G. (2014). The cumulative effect of different childhood trauma types on self-reported symptoms of adult male depression and PTSD, substance abuse and health-related quality of life in a large active-duty military cohort. *Journal of Psychiatric Research*, 58, 46-54. <https://doi.org/10.1016/j.jpsychires.2014.07.014>
- Aguilera, M., Arias, B., Wichers, N., Barrantes-Vidal, N., Moya, J., Villa, H., Van Os, J., Ibáñez, Ruipérez, M. A., Ortet, G., & Fananás (2009). Early adversity and 5-HTT/BDNF genes: New evidence of gene-environment interactions on depressive symptoms in a general population. *Psychological Medicine*, 39, 1425-1432. <https://doi.org/10.1017/S0033291709005248>
- Allen, P., Bennett, K., & Heritage, B. (2014). *SPSS Statistics Version 22: A practical guide* (3rd ed.).
- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.).
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Andrews, G., & Peters, L. (1998). The psychometric properties of the Composite International Diagnostic Interview. *Social Psychiatry & Psychiatric Epidemiology*, 33, 80-88. <https://doi.org/10.1007/s001270050026>
- Angelakis, I., & Gooding, P. (2022). Associations of anxiety and depression with suicide experiences in individuals with and without childhood trauma: The role of social support. *Psychiatry Research*, 309, 114424. <https://doi.org/10.1016/j.psychres.2022.114424>

Axelson, D. A., & Birmaher, B. (2001). Relation between anxiety and depressive disorders in childhood and adolescence. *Depression and Anxiety, 14*, 67-78.

<https://doi.org/10.1002/da.1048>

Breier, A. Charney, D. S., & Heninger, G. R. (1985). The diagnostic validity of anxiety disorders and their relationship to depressive illness. *American Journal of Psychiatry, 142*, 787-797. <https://doi.org/10.1176/ajp.142.7.787>

Brunstein-Klomek, A., Marrocco, F., Kleinman, M., Schonfeld, I. S., & Gould, M. S. (2007). Bullying, depression, and suicidality in adolescent. *American Academy of Child and Adolescent Psychiatry, 46*, 40-49.

<https://doi.org/10.1097/01.chi.0000242237.84925.18>

Budtz-Jørgensen, E., Kleiding, N., Grandjean, P., & Weihe, P. (2007). Confounder selection in environmental epidemiology: Assessment of health effects of prenatal mercury exposure. *Annals of Epidemiology, 17*, 27-35.

<https://doi.org/10.1016/j.annepidem.2006.05.007>

Chapman, D. P., Whitfield, C. L., Felitti, V. J., Dube, S. R., Edwards, V. J., & Anda, R. F. (2004). Adverse childhood experiences and the risk of depressive disorders in adulthood. *Journal of Affective Disorders, 82*, 217-225.

<https://doi.org/10.1016/j.jad.2003.12.013>

Chen, Z., Shen, S., & Dai, Q. (2021). Long-term and short-term psycho-social predictors of early-adulthood depression: Role of childhood trauma, neuroticism, social-support, resilience, and life-events. *Current Psychology, 1*, 1-13.

<https://doi.org/10.1007/s12144-021-01570-5>

Chi, T. C., & Hinshaw, S. P. (2002). Mother-child relationships of children with ADHD: The role of maternal depressive symptoms and depression-related distortions. *Journal of Abnormal Child Psychology, 30*, 387-400. <https://doi.org/10.1023/A:1015770025043>

- Costello, E. J., Erkanli, A., Fairbank, J. A., & Angold, A. (2002). The prevalence of potentially traumatic events in childhood and adolescence. *Journal of Traumatic Stress, 15*, 99-112. <https://doi.org/10.1023/A:1014851823163>
- Cohen, J. A., & Mannarino, A. P. (1996). Factors that mediate treatment outcome of sexually abused preschool children. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 1402-1410. <https://doi.org/10.1097/00004583-199610000-00028>
- Cuijpers, P., & Smit, F. (2004). Subthreshold depression as a risk indicator for major depressive disorder: A systematic review of prospective studies. *Acta Psychiatrica Scandinavica, 109*, 325-331. <https://doi.org/10.1111/j.1600-0447.2004.00301.x>
- Dantchev, S., Hickman, M., Heron, J., Zammit, S., & Wolke, D. (2019). The independent and cumulative effects of sibling and peer bullying in childhood on depression, anxiety, suicidal ideation, and self-harm in adulthood. *Frontiers in Psychiatry, 10*, 651. <https://doi.org/10.3389/fpsyt.2019.00651>
- El-Khodary, B., & Samara, M. (2019). The mediating role of trait emotional intelligence, prosocial behaviour, parental support and parental psychological control on the relationship between war trauma, and PTSD and depression. *Journal of Research in Personality, 8*, 246-256. <https://doi.org/10.1016/j.jrp.2019.06.004>
- Farmer, A. Y., & Lee, S. K. (2011). The effects of parenting stress, perceived mastery, and maternal depression on parent-child interaction. *Journal of Social Service Research, 37*, 516-525. <https://doi.org/10.1080/01488376.2011.607367>
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175-191.
- Fava, G. A., & Tossani, E. (2007). Prodromal stage of major depression. *Early Intervention in Psychiatry, 1*, 9-18. <https://doi.org/10.1111/j.1751-7893.2007.00005.x>

- Fowler, J. C., Allen, J. G., Oldham, J. M., & Frueh, B. C. Exposure to interpersonal trauma, attachment insecurity, and depression severity. *Journal of Affective Disorders*, 149, 313-318. <https://doi.org/10.1016/j.jad.2013.01.045>
- Godbout, N., Briere, J., Sabourin, S., & Lussier, Y. (2014). Child sexual abuse and subsequent relational and personal functioning: The role of parental support. *Child Abuse & Neglect*, 38, 317-325. <https://dx.doi.org/10.1016/j.chiabu.2013.10.001>
- Hartman, C. A., Hox, J., Mellenbergh, G. J., Boyle, M. H., Offord, D. R., Racine, Y., McNamee, J., Gadown, K. D., Sprafkin, J., Kelly, K. L., Nolan, E. E., Tannock, R., Schachar, R., Schut, H., Postma, I., Drost, R., & Sergeant, J. A. (2003). DSM-IV internal construct validity: When taxonomy meets data. *Journal of Child Psychology and Psychiatry*, 42, 817-836. <https://doi.org/10.1111/1469-7610.00778>
- Hasin, D. S., Goodwin, R. D., Stinson, F. S., & Grant, B. F. (2005). Epidemiology of major depressive disorder: Results from the national epidemiologic survey alcoholism and related conditions. *Archives of General Psychiatry*, 62, 1097-1106. <https://doi.org/10.1001/archpsyc.62.10.1097>
- Havinga, P. J., Boschloo, L., Bloemen, A. J. Nauta, M. H., De Vries, S. O., Pennix, B. W., Schoevers, R. A., & Hartman, C. A. (2017) Doomed for disorder? High incidence of mood and anxiety disorders in offspring of depressed and anxious patients: A prospective cohort study. *Journal of Clinical Psychiatry*, 78, 8-17. <https://doi.org/10.4088/JCP.15m09936>
- Hayashi, Y., Okamoto, Y., Takagaki, K., Okada, G., Toki, S., Inoue, T., Tanabe, H., Kobayakawa, M., & Yamawaki, S. (2015). Direct and indirect influences of childhood abuse on depression symptoms in patients with major depressive disorder. *BMC Psychiatry*, 15, 244. <https://doi.org/10.1186/s12888-015-0636-1>

- Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis* (3rd Ed.)
- Hellfeldt, K., López-Romero, L., & Andershed, H. (2019). Cyberbullying and psychological well-being in young adolescence: The potential protective mediation effects of social support from parents, friends, and teachers. *International Journal of Environmental Research and Public Health*, *17*, 45. <https://doi.org/10.3390/ijerph17010045>
- Hovens, J. G. F. M., Wiersma, J. E., Van Oppen, G. P., Spinhoven, P., Penninx, B. W. J. H., & Zitman, F. G. (2010). Childhood life events and childhood trauma in adult patients with depressive, anxiety and comorbid disorders vs. controls. *Acta Psychiatrica Scandinavica*, *122*, 66-74. <https://doi.org/10.1111/j.1600-0447.2009.01491.x>
- Jaworska-Andryszewska, P., & Rybakowski, J. K. (2019). Childhood trauma in mood disorders: Neurobiological mechanisms and implications for treatment. *Pharmalogical Reports*, *71*, 112-120. <https://doi.org/10.1016/j.pharep.2018.10.004>
- Kendall-Tackett, K. (2002). The health effects of childhood abuse: Four pathways by which abuse can influence health. *Child Abuse and Neglect*, *6*, 715-730. [https://doi.org/10.1016/S0145-2134\(02\)00343-5](https://doi.org/10.1016/S0145-2134(02)00343-5)
- Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Ormel, J., Üstün, T. B., & Wang, P. S. (2009). The global burden of mental disorders: An update from the WHO world mental health (WMH) surveys. *Epidemiology and Psychiatric Sciences*, *18*, 23-33. <https://doi.org/10.1017/S1121189X00001421>
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distribution of DSM-IV disorders in the national comorbidity survey replication. *Archives Of General Psychiatry*, *62*, 593-602. <https://doi.org/10.1001/archpsyc.62.6.593>

- Kessler, R. C., & Üstün, B. T. (2004). 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, 13*.
<https://doi.org/10.1002/mpr.168>
- Klasen, F., Oettingen, G., Daniels, J., & Adam, H. (2010). Multiple trauma and mental health in former Ugandan child soldiers. *Journal of Traumatic Stress, 23*, 573-581.
<https://doi.org/10.1002/jts.20557>
- Klein, D. N., Arnow, B. A., Barkin, J. L., Dowling, F., Kocsis, J. H., Leon, A. C., Manber, R., Rothbaum, B. O., Trivedi, M. H., & Wisniewski, S. R. (2009). Early adversity in chronic depression: Clinical correlates and responses to pharmacotherapy. *Depression and Anxiety, 26*, 701-710. <https://doi.org/10.1002/da.20577>
- Mandelli, L., Petrelli, C., & Serretti, A. (2015). The role of specific early trauma in adult depression: A meta-analysis of published literature. Childhood trauma and adult depression. *European Psychiatry, 30*, 665-680.
<https://dx.doi.org/10.1016/j.eurpsy.2015.04.007>
- Marshall, M., Shannon, C., Meenagh, C., Mc Corry, N., & Mulholland, C. (2017). The association between childhood trauma, parental bonding and depressive symptoms and interpersonal functioning in depression and bipolar disorder. *Irish Journal of Psychological Medicine, 35*, 23-32. <https://doi.org/10.1017/ipm.2016.43>
- Murray, L., Cooper, P. J., Wilson, A., & Romaniuk, H. (2002). Controlled trial of the short- and long-term effect of psychological treatment of post-partum depression. *British Journal of Psychiatry, 102*, 420-427. <https://doi.org/10.1192/bjp.182.5.420>
- Nanni, V., Uher, R., & Danese, A. (2012). Childhood maltreatment predicts unfavorable course of illness and treatment outcome in depression: A meta-analysis. *American Journal of Psychiatry, 169*, 141-151. <https://doi.org/10.1176/appi.ajp.2011.11020335>

- Nelson, J., Klumpp, A., Doebler, P., & Ehring, T. (2017). Childhood maltreatment and characteristics of adult depression: Meta-analysis. *The British Journal of Psychiatry*, *201*, 96-104. <https://doi.org/10.1192/bjp.bp.115.180752>
- Paananen, R., Tuulio-Henriksson, A., Merikukka, M., & Gissler, M. (2021). Intergenerational transmission of psychiatric disorders: The 1987 Finnish Birth Cohort Study. *European Child & Adolescent Psychiatry*, *30*, 381-389. <https://doi.org/10.1007/s00787-020-01524-5>
- Paterniti, S., Sterner, I., Caldwell, C., & Bissler, J. C. (2017). Childhood neglect predicts the course of major depression in a tertiary care sample: A follow-up study. *BMC Psychiatry*, *17*, 113. <https://doi.org/10.1186/s12888-017-1270-x>
- Rapaport, M. H., Clary, C., Fayyad, R., & Endicott, J. (2005). Quality-of-life impairment in depressive and anxiety disorders. *The American Journal of Psychiatry*, *162*, 1171-1178. <https://doi.org/10.1176/appi.ajp.162.6.1171>
- Rasic, D., Hajek, T., Alda, M., Uher, R. (2014). Risk of mental illness in offspring of parents with schizophrenia, bipolar disorder, and major depressive disorder: A meta-analysis of family high-risk studies. *Schizophrenia Bulletin*, *40*, 28-38. <https://doi.org/10.1093/schbul/sbt114>
- Russell, D., Springer, K. W., & Greenfield, E. A. (2010). Witnessing domestic abuse in childhood as an independent risk factor for depressive symptoms in young adulthood. *Child Abuse & Neglect*, *34*, 448-453. <https://doi.org/10.1016/j.chiabu.2009.10.004>
- Salloum, A., Smith Stover, C., Swaidan, V. R., & Storch, E. A. (2015). Parent and child PTSD and parent depression in relation to parenting stress among trauma-exposed children. *Journal of Child & Family Studies*, *24*, 1203-1212. <https://doi.org/10.1007/s10826-014-9928-1>

- Sarason, I. G., Sarason, B. R., Shearin, E. N., & Pierce, G. R. (1987). A brief measure of social support: Practical and theoretical implications. *Journal of Social and Personal Relationships, 4*, 497-510. <https://doi.org/10.1177/0265407587044007>
- Schoevers, R. A., Deeg, D. J. H., Van Tilburg, W., & Beekman, A. T. F. (2005). Depression and generalized anxiety disorder: Co-occurrence and longitudinal patterns in elderly patients. *The American Journal of Geriatric Psychiatry, 13*, 31-39. <https://doi.org/10.1097/00019442-200501000-00006>
- Sippel, L. M., Pietrzak, R. H., Dennis, S. Charney, D. S., Mayes, L. C., & Southwick, S. M. (2015). How does social support enhance resilience in the trauma-exposed individual? *Ecology and Society, 20*, 10. <https://doi.org/10.5751/ES-07832-200410>
- Smith, D. J., & Blackwood, D. H. R. (2004). Depression in young adults. *Advances in Psychiatric Treatment, 10*, 4-12. <https://doi.org/10.1192/apt.10.1.4>
- Smith, K. (2014). Mental health: A world of depression. *Nature, 515*, 180-181. <https://doi.org/10.1038/515180a>
- Spinhoven, P., Elzinga, B. M., Hovens, J. G. F. M., Roelofs, K., Zitman, F. G., Van Oppen, P., & Penninx, B. W. J. H. (2010). The specificity of childhood adversities and negative life events across the life span to anxiety and depressive disorders. *Journal of Affective Disorders, 126*, 103-112. <https://doi.org/10.1016/j.jad.2010.02.132>
- Thapar, A., Collishaw, S., Pine, D. S., Thapar, A. K. (2012). Depression in adolescence. *Lancet, 379*, 9820. [https://doi.org/10.1016/S0140-6736\(11\)60871-4](https://doi.org/10.1016/S0140-6736(11)60871-4)
- Tiller, J. W. G. (2013). Depression and anxiety. *Medical Journal of Australia, 199*, 28-31. <https://doi.org/10.5694/mja12.10628>
- Timmer, S. G., Ho, L. K. L., Urquiza, A. J., Zebell, N. M., Fernandez y Garcia, E., & Boys, D. (2011). The effectiveness of parent-child interaction therapy with depressive mothers: The changing relationship as the agent of individual change. *Child*

Psychiatry Human Development, 42, 406-423.

<https://doi.org/10.1007/s10578-011-0226-5>

Van de Ven, P. (2020). The journey of sensemaking and identity construction in the aftermath of trauma: Peer support as a vehicle for coconstruction. *Journal of Community Psychology*, 48, 1825-1839. <https://doi.org/10.1002/jcop.22373>

Vandeleur, C., Rothen, S., Gholam-Rezaee, M., Castelao, E., Vidal, S., Favre, S., Ferrero, F., Halfon, O., Fumeaux, P., Merikangas, K. R., Aubry, J. M., Burstein, M., & Preisig, M. (2012). Mental disorders in offspring of parents with bipolar and major depressive disorders. *Bipolar Disorders*, 40, 641-653.

<https://doi.org/10.1111/j.1399-5618.2012.01048.x>

Vitriol, V., Cancino, A., Weil, K., Salgado, C., Asenjo, M. A., & Potthoff, S. (2014).

Depression and psychological trauma: An overview integrating current research and specific evidence of studies in the treatment of depression in public mental health services in Chile. *Depression Research and Treatment*, 2014.

<https://dx.doi.org/10.1155/2014/608671>

Weissman, M. M., Wickramaratne, P., Gameroff, M. J., Warner, V., Pilowsky, D., Gathibandhne Kohad, R., Verdeli, H., Skipper, J., & Talati, A. (2016). Offspring of depressed parents: 30 years later. *The American Journal of Psychiatry*, 173,

1024-1032. <https://doi.org/10.1176/appi.ajp.2016.15101327>

Witt, A., Brown, R. C., Plener, P. L., Brähler, E., & Fegert, J. M. (2017). Child maltreatment in Germany: Prevalence rates in the general population. *Child and Adolescent Psychiatry and Mental Health*, 11. <https://doi.org/10.1186/s13034-017-0185-0>

Wittchen, H. U. (1994). Reliability and validity studies of the WHO-Composite International Diagnostic Interview (CIDI): A critical review. *Journal of Psychiatric Research*, 28, 57-84. [https://doi.org/10.1016/0022-3956\(94\)90036-1](https://doi.org/10.1016/0022-3956(94)90036-1)

Wittchen, H. U., Robins, L. N., Cottler, L. B., Sartorius, N., Burke, J. D., & Regier, D.

(1991). Cross-cultural feasibility, reliability and sources of variance of the Composite International Diagnostic Interview (CIDI). *British Journal of Psychiatry*, *159*, 645-653. <https://doi.org/10.1192/bjp.159.5.645>

Zimmerman, M., Ellison, W., Young, D., Chelminski, I., & Dalrymple, K. (2015). How many different ways do patients meet the diagnostic criteria for major depressive disorder? *Comprehensive Psychiatry*, *56*, 29-34.

<https://doi.org/10.1016/j.comppsy.2014.09.007>

Appendix A

Table 1.

Types of Traumatic Experiences

War experience
Held captive or kidnapped
Life-threatening accident
Life-threatening disease
Physically attacked or assaulted
Robbed or threatened with a weapon
Raped
Sexual abuse, molestation, or assault
Unexpected death of close person
Witnessing someone being badly injured or killed or dead body
Done anything that resulted in severe injury or death to another
Other extremely stressful or upsetting event
Event of the list happening with a close person
Experience he/she doesn't want to talk about

Table 4.

Summary of Hierarchical Binary Logistic Regression Analysis for Traumatic Experiences and Depressive Disorder

	Unadjusted			Adjusted		
	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>
Experienced trauma						
No						<i>Reference</i>

One	3.07	[1.70, 5.56]	<.001	2.18	[1.12, 4.24]	<.05
Multiple	4.85	[2.71, 8.67]	<.001	2.80	[1.43, 5.49]	<.01

Note. $N = 518$