



## Research paper

# Incident mental disorders in the aftermath of traumatic events: A prospective-longitudinal community study



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## ABSTRACT

**Background:** Few strictly prospective-longitudinal community studies examined the role of traumatic events for risk of developing a broad range of incident mental disorders over several years.

**Method:** A representative community sample of adolescents and young adults ( $n = 2797$ , baseline age 14–24) was prospectively examined in up to three assessment waves over up to 10 years. Traumatic events and DSM-IV mental disorders were assessed at each wave using the DIA-X/M-CIDI. Associations between traumatic events (meeting the DSM-IV A1-criterion for posttraumatic stress disorder, PTSD) or qualifying traumatic events (meeting the DSM-IV A2-criterion) at baseline and incident disorders at follow-up were tested with logistic regressions adjusted for gender and age.

**Results:** While traumatic and qualifying traumatic events at baseline were related to various baseline disorders, considerably fewer associations were found in strictly prospective analyses with incident disorders at follow-up as outcomes. After adjustment for baseline disorders, only (a) the association of traumatic events with incident specific phobias (Odds Ratio, OR = 1.6) and (b) the associations of qualifying traumatic events with incident specific phobias (OR = 1.6), PTSD (OR = 2.5) and major depressive episodes (OR = 1.4) remained significant.

**Conclusion:** Targeted prevention and early intervention among traumatized individuals may be particularly beneficial to lower the incidence of specific phobias and MDE besides PTSD.

**Limitations:** Associations between traumatic events and incident mental disorders might be underestimated, as cases developing psychopathology immediately after trauma exposure prior to baseline were excluded in our strictly prospective analyses.

## 1. Introduction

It is well established that traumatic events - especially when occurring during sensitive phases such as early infancy or puberty – increase vulnerability to various unfavorable health outcomes and mental disorders (Cogle et al., 2010; Ginzburg et al., 2010; Green et al., 2010; Guo et al., 2017; Hussain et al., 2011; Kessler et al., 2010; McLaughlin et al., 2010, 2012; Meyers et al., 2015; Molnar et al., 2001; Perkonigg et al., 2000). For instance, in the WHO World Mental Health Surveys, retrospectively reported childhood adversities consistently predicted subsequent incident DSM-IV mental disorders across diagnostic classes,

life-course stages and countries (Kessler et al., 2010). In the Early Developmental Stages of Psychopathology Study (EDSP), traumatic events as well as subthreshold and threshold posttraumatic stress disorder (PTSD) were associated with various mental disorders (Perkonigg et al., 2000, 2005, 2004; von Sydow et al., 2002; Wittchen et al., 2003; Zimmermann et al., 2008, 2011), psychotic symptoms (Dominguez et al., 2010; Schutters et al., 2012; Spauwen et al., 2006; Wigman et al., 2012) and obesity (Perkonigg et al., 2009). As suggested by human and animal studies, exposure to traumatic events might induce prolonged unfavorable endocrine, neural and psychophysiological changes in stress responsivity, thus leading to an increased probability of

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developing mental disorders in response to subsequent distress and adversity (Hastings et al., 2016; Heim and Binder, 2012; Kubera et al., 2011; Rohleder et al., 2004).

However, most previous research was based on cross-sectional data and considerably fewer studies prospectively examined the predictive role of traumatic events for subsequent specific mental disorders: In the EDSP, traumatic events at baseline predicted incident major depressive episodes (MDE) (Zimmermann et al., 2008, 2011) and cannabis abuse/dependence (von Sydow et al., 2002) at follow-up. Traumatic events and/or PTSD prospectively increased the risk of developing incident premenstrual dysphoric disorder (Perkonig et al., 2004; Wittchen et al., 2003), incident somatoform disorder and any anxiety disorder (Perkonig et al., 2005) as well as obesity (Perkonig et al., 2009). Other studies evidenced that severe childhood adversities, traumatic events and subthreshold/ threshold PTSD prospectively predicted subsequent panic attacks (Goodwin et al., 2005), anxiety disorders (Cortes et al., 2005; Goodwin et al., 2005), major depressive disorder (Spatz Widom et al., 2007), substance use disorders (Breslau et al., 2003; Harrington et al., 2011; Kilpatrick et al., 1997; Reed et al., 2007; von Sydow et al., 2002), eating disorders (Johnson et al., 2002) or psychotic episodes (Kelleher et al., 2013). In summary, although some research investigated prospective associations between traumatic events and individual outcomes, additional studies are needed to prospectively examine the role of traumatic events as a risk factor for a variety of subsequent first incident mental disorders.

Because previous mental disorders might not only increase the probability of developing secondary other mental disorders (Bittner et al., 2007; Copeland et al., 2013, 2009) but also of experiencing traumatic events (Koenen et al., 2002), it is particularly important to account for other baseline mental disorders in such strictly prospective analyses.

Because multiple adversities might induce higher distress and thus additionally promote the risk of developing mental disorders (Suliman et al., 2009; Zimmermann et al., 2008), it is further crucial to study whether the associations with individual outcomes increase with a higher number of reported traumatic events.

Moreover, gender-specific differences in associations between traumatic events and incident mental disorders should be considered: Females were shown to be less likely to experience traumatic events as compared to males, but to be at increased risk of developing subsequent PTSD and closely associated symptoms and disorders (Breslau, 2002; Freedman et al., 2002; Tolin and Foa, 2006). In general, gender-specific vulnerabilities for internalizing vs. externalizing disorders (females are at increased risk for internalizing, while males are at increased risk for externalizing psychopathology (Beesdo-Baum et al., 2015; Jacobi et al., 2015; Wittchen and Jacobi, 2005)) might affect the probability of individual outcome disorders, leading to more pronounced associations of traumatic events with specific anxiety, affective, somatoform and eating disorders in females and more pronounced associations of traumatic events with substance use disorders in males.

Using data from a representative community sample of adolescents and young adults, we aim to examine prospective-longitudinal associations between traumatic events at baseline and incident psychopathology at follow-up including PTSD as well as other specific anxiety, affective, substance use, somatoform and eating disorders. The role of gender and number of traumatic events will be additionally considered. We hypothesize that (a) traumatic events at baseline increase the risk for various incident mental disorders at follow-up and that (b) these associations remain stable over and above the effects of other baseline mental disorders. We further hypothesize that (c) gender-specific vulnerabilities and (d) a higher number of reported traumatic events increase the risk of the considered outcome disorders.

## 2. Materials and methods

### 2.1. Sample

Data come from the Early Developmental Stages of Psychopathology Study (EDSP), a prospective-longitudinal study among a representative community sample of adolescents and young adults with one baseline (T0, 1995,  $n = 3021$ ; response rate 70.8%) and 3 follow-up investigations (T1, 1996/97,  $n = 1228$ , only younger cohort, response rate 88.0%; T2, 1998/99,  $n = 2548$ , response rate 84.3%; T3, 2003,  $n = 2210$ , response rate 73.2%). The sample was drawn randomly from the Munich area (Germany); participants were aged 14–24 years at baseline and 21–34 years at last follow-up. Because the EDSP focuses on early developmental stages of psychopathology, 14–15 year-olds were sampled at twice the probability of individuals aged 16–21 years, and 22–24 year-olds were sampled at half this probability. At T1, only the younger EDSP cohort (aged 14–17 at baseline) was examined, whereas at T0, T2, and T3, both cohorts (younger and older, aged 18–24 at baseline) were investigated. Further information on methods and design has been previously presented (Beesdo-Baum et al., 2015; Lieb et al., 2000; Wittchen et al., 1998b). The detailed study flow chart has been presented in Beesdo-Baum et al. (2015).

### 2.2. Assessment of traumatic events and mental disorders

Diagnostic information was assessed repeatedly using the lifetime (baseline) and interval version (follow-up assessments) of the Computer-Assisted Personal Interview (CAPI) version of the Munich-Composite International Diagnostic Interview (DIA-X/M-CIDI) (Wittchen and Pfister, 1997). The M-CIDI is an updated version of the World Health Organization's CIDI version 1.2 (World Health Organization, 1990) with additional questions to cover DSM-IV (American Psychiatric, 1994) and ICD-10 (World Health Organization, 1991) criteria. The fully standardized M-CIDI assesses symptoms, syndromes and diagnoses of 48 mental disorders including additional information on onset, duration, and severity. It is well established and widely applied in clinical-epidemiological research. Test-retest reliability of the M-CIDI has been shown to be good for almost all DSM-IV symptoms and diagnoses, with kappa values ranging from .54 for generalized anxiety disorder (GAD) to 1.00 for panic disorder (Wittchen et al., 1998a). More detailed information has been presented elsewhere (Reed et al., 1998; Wittchen et al., 1998a).

Traumatic events were assessed in the M-CIDI N-section for PTSD. First, traumatic events (according to DSM-IV PTSD criterion A1) were assessed using a list with 8 specified events (war experience, being physically attacked, rape, sexual abuse as a child, natural disasters, serious accidents, imprisonment, and witness of traumatic events to others) and one open category. Second, DSM-IV PTSD criterion A2 (experience of intense fear, helplessness, or horror in response to the experienced event) was assessed for each indicated traumatic event. Third, participants with traumatic events meeting DSM-IV PTSD criterion A2 (subsequently referred to as qualifying traumatic events herein) were asked to indicate the most distressing qualifying traumatic event followed by symptom questions assessing DSM-IV PTSD criteria. Among individuals indicating multiple qualifying traumatic events, symptom questions on PTSD referred to the most distressing event. More detailed information on the assessment of traumatic events and PTSD in the EDSP has been previously published (Perkonig et al., 2000, 2005). Frequencies and percentages for individual types of traumatic events in the total sample, males and females as well as associations with PTSD at baseline can be found in Perkonig et al. (2000).

The present study focuses on associations between lifetime traumatic events retrospectively reported at baseline (predictor) and incident DSM-IV mental disorders at follow-up (outcome; first lifetime incidences cumulated from T1 until T3). The collapsed category any

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