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Childhood trauma as a risk factor for the onset of subclinical psychotic experiences: Exploring the mediating effect of stress sensitivity in a cross-sectional epidemiological community study

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ABSTRACT

Childhood trauma is a risk factor for the onset of schizophrenic psychosis. Because the psychosis phenotype can be described as a continuum with varying levels of severity and persistence, childhood trauma might likewise increase the risk for psychotic experiences below the diagnostic threshold. But the impact of stressful experiences depends upon its subjective appraisal. Therefore, varying degrees of stress sensitivity possibly mediate how childhood trauma impacts in the end upon the occurrence of subclinical psychotic experiences.

We investigated this research question in a representative community cohort of 1500 participants. A questionnaire, comprising five domains of physical and emotional neglect, as well as physical, emotional, and sexual abuse, was used to assess childhood trauma. Based on different symptoms of subclinical psychotic experiences, we conducted a latent profile analysis (LPA) to derive distinct profiles for such experiences. Path modeling was performed to identify the direct and indirect (via stress sensitivity) pathways from childhood trauma to subclinical psychotic experiences.

The LPA revealed four classes — unaffected, anomalous perceptions, odd beliefs and behavior, and combined anomalous perceptions/odd beliefs and behavior, that – except for sexual abuse – were all linked to childhood trauma. Moreover, except for physical abuse, childhood trauma was significantly associated with stress sensitivity. Thus, our results revealed that the pathways from emotional neglect/abuse and physical neglect to subclinical psychotic experiences were mediated by stress sensitivity.

In conclusion, we can state that subclinical psychotic experiences are affected by childhood traumatic experiences in particular through the pathway of a heightened subjective stress appraisal.

1. Introduction

Much evidence has been found for the influence of environmental factors that increase the risk for the onset and impact on the course of psychosis (van Os et al., 2010). A possible link between environmental risk factors and psychosis is distress from subjectively perceived stressful events in persons with a heightened vulnerability for psychotic experiences (Gibson et al., 2014; Phillips et al., 2007).

In this respect childhood trauma has received much interest. In light of several meta-analyses, including case–control, prospective, and cross-sectional studies, childhood trauma has been endorsed on a broad empirical basis as a potential risk factor for the onset of *schizophrenic psychosis* (Holtzman et al., 2013; Matheson et al., 2013; Varese et al., 2012; Wigman et al., 2012; Schäfer and Fisher, 2011).

As the occurrence of a psychosis phenotype can be characterized as a continuum with differing levels of severity and persistence (Rössler et al., 2007; Wigman et al., 2011), childhood trauma might be likewise a potential risk factor for *subclinical psychotic experiences*, i.e. long before a schizophrenic disorder is diagnosed (Kessler et al., 2010). Such psychotic experiences below the diagnostic threshold for schizophrenia and other psychotic disorders are quite prevalent in the general population (Rössler et al., 2013a; Rössler et al., 2014; Rössler et al., 2013b; Rössler et al., 2007; van Os et al., 2000; Wiles et al., 2006) even across socio-culturally different countries (Loch et al., 2011). A review of 61 incidence and prevalence studies of population rates for subclinical symptoms revealed a median prevalence rate of 7.2% and a median annual incidence rate of 2.5%, albeit with significant variation in those rates (Linscott and van Os, 2013).

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Here, we aimed to investigate the impact of environmental factors on the development of psychotic symptomatology, focusing especially on the pathways from childhood trauma to subclinical psychotic experiences in adulthood related to increased stress sensitivity. One advantage of using a continuum model is that the grading of levels in symptomatic severity and persistence mirrors reality much better than do categorical measures, which are accompanied by a loss of information.

However, recent research has cautioned that, at the lower end of the spectrum, homogeneous subsets of individuals exist with certain profiles of subclinical psychotic experiences (Tabak and de Mamani, 2013). Therefore, our study sought to determine whether different subgroups of subclinical psychotic experiences exist and whether childhood trauma is linked to those subgroups in adulthood. In a previous study we already confirmed the link between childhood adversities and subclinical psychotic experiences (Rössler et al., 2014). Here we wanted to explore how various forms of childhood trauma and heightened stress sensitivity influence those subclinical psychotic experiences subgroups and to examine whether stress sensitivity acts as a mediator within the pathway(s) between childhood trauma and subclinical psychotic experiences.

In addition, a number of potentially confounding variables must be taken into account as control variables when examining potential associations between childhood trauma and subclinical psychotic experiences. Studies have inconsistently found that subclinical psychotic experiences are linked to male gender and younger age (Calkins et al., 2014; Spauwen et al., 2003; Rössler et al., 2012; Rössler et al., 2015).

Thus, we aimed to analyze in exploratory analyses (i) whether childhood trauma impacts on the occurrence of *subclinical* psychotic experiences as it is known with respect to diagnosable psychotic disorders, (ii) whether this impact might be different for different types of trauma and (iii) different subgroups of psychotic experiences, and (iv) whether this impact is possibly mediated by individual stress sensitivity.

2. Methods

2.1. Study design and sampling

This epidemiological study was conducted as part of the Zurich Programme for Sustainable Development of Mental Health Services, a research program with nine sub-projects (www.zinep.ch).

As a first step in the epidemiology survey, we used a computer-assisted telephone interview (CATI) to screen 9829 Swiss participants, aged 20 to 41 years, who were representative of the general population of the canton of Zurich. The Symptom Checklist—27 (SCL-27) (Hardt et al., 2004) served as our screening instrument. Participants were randomly chosen through the residents' registration offices for the canton. Residents without Swiss nationality were excluded. The overall response rate was 53.6%. Reasons for non-response were no telephone connection, reaching only a telephone answering machine, incorrect telephone number, communication impossible, unavailability during the study period, or refusal by the target person or a third party. In cases where potential subjects were available by telephone the response rate was 73.9%.

In a second step, we randomly selected 1500 subjects from the initial screening sample for comprehensive face-to-face interviews (response rate: 65.2%) that were conducted by trained and experienced clinical psychologists. All subjects who completed the semi-structured interviews were subsequently asked to complete various questionnaires. The sample pool was divided into two subsamples focusing on either personality disorders (N = 680) or psychosis (N = 820); we used the latter group for the current study. All assessments were completed between August 2010 and September 2012.

Our stratified-sampling procedure included 60% high-scorers (i.e., scoring below the 75th percentile of the global severity index (GSI) for the SCL-27) and 40% low-scorers (i.e. below the 75th percentile of the GSI). This design was chosen to enrich the sample pool with subjects at higher risk for mental disorders. Such a two-phase procedure – initial screening and comprehensive interviews with a stratified subsample – is fairly common in epidemiological research (Dunn et al., 1999). The study design has been explained in further detail by Ajdacic-Gross et al. (2014).

The ethics committee of the canton of Zurich (KEK) approved the ZInEP Epidemiology Survey as fulfilling all requirements for legal and private data protection. It was designed to be in strict accordance with the declaration of Helsinki of the World Medical Association as revised in 2008. All participants gave written informed consent.

The ZInEP epidemiological survey was funded by a private foundation certified by the cantonal health authorities. The foundation had no further role in the experimental design; the collection, analysis, and interpretation of data; the writing of this report; or the decision to submit this paper for publication.

2.2. Measures

Because no consistent description is available for what actually constitutes subclinical psychotic experiences, we examined the data collected via different questionnaires about a variety of related symptoms that might present in a community sample.

We used the following psychopathological instruments and questionnaires as indicators for subclinical psychotic experiences:

- The Structured Interview for Assessing Perceptual Anomalies (SIAPA) (Bunney et al., 1999). There, perceptual and attentional anomalies such as hyper-alertness and poor selective attention to external stimuli are evaluated. The SIAPA focuses on auditory, visual, tactile, olfactory, and gustatory modalities. For the ZInEP Epidemiology Survey the SIAPA was adapted as a self-report questionnaire. Reliability and validity of the original interview form are good (Bunney et al., 1999).
- The German version (Klein et al., 1997) of the brief form of the Schizotypal Personality Questionnaire (SPQ-B) (Raine and Benishay, 1995), contains 22 items and measures three factors of schizotypy, namely “cognitive-perceptual” (SPQ-cog: paranoid ideation, illusionary perception), “interpersonal” (SPQ-int: lack of close friends, social withdrawal, anhedonia), and “disorganized” (SPQ-dis: eccentric behavior, odd mannerisms). Internal consistency and test–retest reliability of the subscales are high (Raine and Benishay, 1995).
- The Paranoia Checklist (PARA) (Freeman et al., 2005) is a self-report instrument with 18 items. Each item assessing a feature of paranoid and suspicious thoughts is rated separately for frequency (PARA-fre), degree of conviction (PARA-con), and distress (PARA-dis). We used the German translation by Lincoln et al. (2009). Internal consistency of the PARA is good and convergent validity has also been provided (Freeman et al., 2005; Lincoln et al., 2009).
- Two psychosis subscales, namely the schizotypal signs scale (STS) and the schizophrenia nuclear symptom scale (SNS) were derived from the Symptom Checklist—90—R (Derogatis, 2000; Schmitz et al., 2000). Since the SCL-90-R original syndrome structure has been questioned we used factor-analytic methods to rearrange the original syndromes “paranoid ideation” and “psychoticism” (Rössler et al., 2007). According to the SCL90-R manual, the six-item subscale “paranoid ideation” is characterized by projective thoughts, hostility, suspiciousness, grandiosity, centrality, fear of loss of autonomy and delusions. The subscale “psychoticism” (10 items) included items indicative of a withdrawn, isolated, schizoid life style as well as items representing symptoms of psychosis and schizophrenia such as hallucinations and thought broadcasting. The factor analyses revealed fairly consistent patterns. The first factor regularly included paranoid ideation items as well as the items “feeling lonely even when with people” and “never feeling close to another person” from the original psychoticism subscale. This factor addresses social and interpersonal deficiencies with reduced capacity for close relationships as well as

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