



## Research paper

# Association of childhood trauma and panic symptom severity in panic disorder: Exploring the mediating role of alexithymia



Zhili Zou, Yulan Huang, Jinyu Wang, Ying He, Wenjiao Min, Xu Chen, Jing Wang, Bo Zhou\*

Department of Psychosomatic, Sichuan Provincial People's Hospital, Chengdu, China

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## ABSTRACT

**Background:** The aim of the present study was to examine the association between childhood trauma (CT), alexithymia, and panic symptom severity in patients with panic disorder (PD). Moreover, the effect of specific subtypes of CT on alexithymia and panic symptom severity was also investigated.

**Methods:** 142 patients with PD and 146 healthy age-matched and sex-matched controls were enrolled in the study. The Structured Clinical Interview for DSM-IV axis I (SCID-I), Childhood Trauma Questionnaire-28 item Short Form (CTQ-28), Toronto Alexithymia Scale (TAS-20), and Panic Disorder Severity Scale (PDSS) were administered to all subjects. The relationships among CT subtypes, alexithymia, and panic symptom severity were investigated using Pearson's correlation analysis. The types of CT that predict alexithymia and panic symptom severity were also investigated using Regression analyses.

**Results:** PD patients showed higher scores on reporting all kinds of CT except sexual abuse. In addition, the TAS-20, DIF (difficulty identifying feelings) and DDF (difficulty describing feelings) scores were significantly higher in patients with PD than in controls. Significant positive correlations were noted among CT, alexithymia and panic symptoms severity. Results of regression analyses showed alexithymia as a mediator between the different types of CT and panic disorder severity, except sexual abuse.

**Limitations:** Although self-report questionnaires are reliable and widely used, the phenomenon of patients who underreport or overreport their symptoms cannot be ignored.

**Conclusion:** The present study showed that CT and alexithymia are more common in patients with PD and impact the severity of panic symptoms. Results suggest that alexithymia may be an important mediator between CT and panic disorder severity.

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## 1. Introduction

Panic disorder (PD) is the most common anxiety disorder, which is characterized by recurrent and unexpected panic attacks, and the lifetime prevalence of panic disorder is 3.4–4.7% (Kessler et al., 1998, 2006). The etiology of this disorder is complex and comprises psychosocial and biological factors (Faravelli and Palanti, 1989; Middeldorp et al., 2005; Abelson et al., 2007; Petrowski et al., 2012; Batinic et al., 2009). Childhood trauma (CT) as a specific environmental factor is one of the most important factors in the development of adult psychopathology (Rayworth et al., 2004; Katerndahl et al., 2005; Afifi et al., 2006; Gibb et al., 2007; Rubino et al., 2009; Wiersma et al., 2009; Hovens et al., 2010; Sugaya et al., 2012). A series of studies also has demonstrated that patients with PD experienced more CT. For example, Bonevski and Novotni (2008) found the patients with PD, compared with

healthy controls, were characterized by significantly higher level of physical abuse, emotional abuse, and emotional neglect. A previous study also discovered that exposure to childhood sexual and physical abuse was associated with increased risks of later panic attack/disorder (Goodwin et al., 2005). It is important to note that previous studies have been conducted in Western populations, and their results may not be generalized to other ethnic groups, such as the Chinese population. Meanwhile, there are few studies in the literature that have examined the relationship between CT and panic symptom severity.

Alexithymia is defined as difficulty realizing, identifying, discriminating, and expressing one's own feelings and the feelings of others (Sifneos, 1988). It is associated with psychiatric and psychosomatic disorders, such as anxiety (Devine et al., 1999), depression (Son et al., 2012; Gulec et al., 2013), somatoform disorders (Tominaga et al., 2014), alcohol addiction (Craparo et al., 2014), and so on. For example, in one study of patients with PD who showed higher level of alexithymia and anxiety sensitivity than controls (Cucchi et al., 2012). However, the association

\* Corresponding author.

E-mail address: [tonyac7721@163.com](mailto:tonyac7721@163.com) (B. Zhou).

between alexithymia and panic symptom severity is still not clear. In addition, previous studies found alexithymia has been linked to CT in the other psychiatric illnesses (Smith and Flannery-Schroeder, 2013; Gulec et al., 2013). There are, unfortunately, few studies in the literature that have examined the relationship between CT and alexithymia in patients with PD. Previous studies found alexithymia as a mediator between CT and self-injurious behaviors (Paivio and McCulloch, 2004). Smith and Flannery-Schroeder (2013), and found that alexithymia mediated the effect of childhood emotional maltreatment on somatic complaints among undergraduate psychology students. Whether alexithymia mediates the association between CT and panic symptom severity is not fully clear.

In this study, our primary objective was to compare levels of CT and alexithymia between patients with PD and healthy controls. Our secondary objective was to examine the association between CT, alexithymia and panic symptom severity in patients with PD. Furthermore, we hypothesized that CT contributes to alexithymia and panic symptom severity.

## 2. Methods

### 2.1. Participants

142 patients with PD were recruited from inpatient and outpatient populations in the Department of Psychosomatic, Sichuan Provincial People's Hospital between May 2012 and December 2014. The Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV) Axis I Disorders (SCID-1) (First et al., 1997) was administered by a trained clinical psychiatrist to include diagnosis of PD, and patients who had comorbidity with mood disorders or other psychiatric disorders were excluded. In addition, 146 healthy age-matched and sex-matched controls were recruited from the Center of Health Examination, Sichuan Provincial People's Hospital. The SCID-1 was also administered by a trained clinical psychiatrist to exclude lifetime or current diagnosis of PD, major depression, schizophrenia and so on. The study was approved by the Sichuan Provincial People's Hospital ethics committee. All subjects provided written informed consent prior to the initiation of study procedures.

### 2.2. Data collection tools

#### 2.2.1. Sociodemographic and clinical characteristics

Sociodemographic and clinical data were collected using a self-designed questionnaire consisting of some questions, such as sex, age, educational level, and marital status, as well as the duration of symptoms for patients with PD.

#### 2.2.2. Childhood Trauma Questionnaire (CTQ)

The Childhood Trauma Questionnaire (CTQ) is a valid and reliable 28-item retrospective self-report inventory. Items are scored 1–5 on a Likert scale ranging from 'never true' to 'very often true,' with a possible range of subscale scores of 5–25. The CTQ yields scores for childhood emotional abuse, physical abuse, sexual abuse, physical neglect and emotional neglect, as well as a total CTQ score (Bernstein and Fink, 1998). Bernstein et al. (2003) reported good internal consistency of the CTQ with alpha reliabilities ranging from 0.70 to 0.93. It was translated into Chinese by Zhao XF and has good internal consistency (Cronbach's alpha) with the CTQ total score (0.77) (Zhao et al., 2005).

#### 2.2.3. Toronto Alexithymia Scale

The Toronto Alexithymia Scale (TAS, also known as the TAS-20)

includes 20 questions across three dimensions, ie, difficulty identifying feelings (DIF), difficulty describing feelings (DDF), and externally oriented thinking (EOT). Each item is scored 1–5 on a Likert scale ranging from "strongly disagree" to "strongly agree" (Bagby et al., 1994). The Chinese version of the TAS-20 has good internal consistency (Cronbach's alpha) with the overall score (0.83) (Yi, et al., 2003).

#### 2.2.4. Panic Disorder Severity Scale (PDSS)

The Panic Disorder Severity Scale comprises 7 items, and participants are instructed to rate each item from 0 to 4 based on the severity of each symptom, with possible responses ranging from "none" to "extremely severe" (Shear et al., 1997). The scale was translated into Chinese by Xiong HF (Xiong et al., 2012), and the Panic Disorder Severity Scale-Chinese Version (PDSS-CV) has good internal consistency (Cronbach's alpha) with the overall score (0.83).

#### 2.2.5. Statistical analysis

The data were analyzed using SPSS version 13.0 software (SPSS Inc., Chicago, IL, USA). Student's *t*-tests were used for inter group comparisons of continuous variables, with Pearson's chi-square tests utilized for categorical variables. Pearson correlation analysis was performed to assess the relationship among study variables. According to Baron and Kenny (1986), testing for mediational effects requires significant correlations (a) between the independent variables and the mediator; (b) the independent variable and dependent variable; (c) the mediator and the dependent variable; and (d) the relationship between the independent and dependent variables is attenuated when the mediator is included in the regression model. Multiple regressions models were performed and assessed to determine whether the association between CT and PDSS was mediated by TAS-20. The first equation regressed independent variable (CTQ Total and subscales) on the mediator (TAS-20). The second equation regressed the independent variable on the dependent variable (PDSS). The third equation regressed both the independent variable and the mediator variable on the dependent variable. We calculated the total variance in the dependent variable accounted for by all the predictors entered into the analysis ( $R^2$ ), we also calculated the standardized beta coefficient ( $\beta$ ) or path coefficient between each independent variable and dependent variable in the model. A full mediational model is supported if the association between the independent variables and the dependent variable is no longer significant, partial mediation is indicated if the relationship remains but is weakened (Baron and Kenny, 1986). We also assessed mediation by using the Sobel test (Sobel, 1982). we divided the indirect effect by its standard error, and then performed a Z test of the null hypothesis that the indirect effect is zero. For all analyses, statistical tests were two-tailed and an alpha level of 0.05 was used to define statistical significance.

## 3. Results

The analyzed sample comprised 142 cases (53 men, 89 women) and 146 controls (61 men, 85 women). No statistically significant differences were noted between cases and controls in terms of sex, age and education level ( $p > 0.05$ ). Among patients with PD, forty-three percent were married ( $n=61$ ), thirty percent were single ( $n=43$ ) and twenty-seven percent were divorced or widowed ( $n=38$ ). A significant group difference was observed in marital status ( $p < 0.05$ ). For the panic cases, the mean total duration of panic disorder was  $3.11 \pm 2.25$  years, and the mean PDSS score was  $12.84 \pm 5.63$  (Table 1).

As shown in Table 2, The patients with PD experienced more CT

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