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Childhood maltreatment and coping in bipolar disorder

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Abstract

A personal history of childhood maltreatment has been associated with unfavorable outcomes in bipolar disorder (BD). The impact of early life stressors on the course of BD may be influenced by individual differences in coping skills. The coping construct relies on neurocognitive mechanisms that are usually influenced by childhood maltreatment. The objective of the present study was to verify the association between childhood maltreatment and coping skills in individuals with BD Type 1. Thirty female euthymic outpatients with BD Type 1 were evaluated using the Childhood Trauma Questionnaire and two additional instruments to measure their coping preferences: Ways of Coping Questionnaire (coping strategies) and Brief COPE (coping styles). Reports of physical abuse (B = .64, $p \leq .01$) and emotional abuse (B = .44, $p = .01$) were associated with the use of maladaptive strategies that focused on emotional control. Adaptive strategies and styles of coping, such as focusing on the problem, were chosen less frequently by women who had experienced emotional neglect (B = .53, $p \leq .01$) and physical abuse (B = -.48, $p \leq .01$) in childhood. The small sample size in the present study prevented subgroup analyses. The sample did not include male BD participants. Our results indicate that early traumatic events may have a long-lasting deleterious influence on coping abilities in female BD patients. Future prospective studies may investigate whether the negative impact of childhood maltreatment over the course of BD is mediated by individual differences in coping abilities. **Keywords:** coping, child abuse, childhood trauma, bipolar disorder.

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Introduction

Adverse experiences in childhood have been recognized as common events in individuals with bipolar disorder (BD), with approximately half (49%) of these individuals reporting at least some form of abuse or neglect during childhood (Garno, Goldberg, Ramirez, & Ritzler, 2005; Leverich et al., 2002). Furthermore, a history of childhood maltreatment (CMT) has been associated with unfavorable characteristics of BD (Alvarez, Roura, Oses, Foguet, Sola, & Arrufat, 2011; Angst, Gamma, Rossler, Ajdacic, & Klein, 2011; Daruy-Filho, Brietzke, Lafer, & Grassi-Oliveira, 2011; Etain, Henry, Bellivier, Mathieu, & Leboyer, 2008; McIntyre et al., 2008), including early age of onset (Carballo et al., 2008; Dienes, Hammen, Henry, Cohen, & Daley, 2006), recurrence (Brown, McBride, Bauer, & Williford, 2005), and decreased response to treatment (Marchand, Wirth, & Simon, 2005).

Childhood maltreatment has also been significantly associated with impairment in cognitive performance among various samples. The neurocognitive domains that appear to be associated with childhood trauma are memory (Grassi-Oliveira, Ashy, & Stein, 2008; Grassi-Oliveira, Stein, Lopes, Teixeira, & Bauer, 2008; Ritchie et al., 2011), attention, and executive function (Viola, Tractenberg, Pezzi, Kristensen, & Grassi-Oliveira, 2013). Neuroimaging findings indicate that CMT is associated with a reduction of the volume of the hippocampus, amygdala, and anterior cingulate cortex in clinical and nonclinical human samples (Bremner et al., 1997; Stein, Koverola, Hanna, Torchia, & McClarty, 1997; Treadway, Grant, Ding, Hollon, Gore, & Shelton, 2009; Vythilingam et al., 2002; Woon, & Hedges, 2008).

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A robust body of evidence indicates that exposure to early life stressors, not just CMT, can negatively impact the clinical course of BD (Kapczinski et al., 2008; Post, & Leverich, 2006). This impact is exerted through changes in immune, endocrine, and molecular mechanisms that modulate neuroplasticity (Bender, Alloy, Sylvia, Urosevic, & Abramson, 2010; Grassi-Oliveira et al., 2008; Kauer-Sant'Anna et al., 2007) and may be influenced by individual differences in stress responsivity. Interestingly, one's coping abilities may be impaired by the effects of stress mediators on relevant neurofunctional circuits (Grassi-Oliveira, Daruy-Filho, & Brietzke, 2010).

According to Folkman, Lazarus, Gruen, & DeLongis (1986), coping comprises the set of mechanisms used by an individual to deal with a stressful situation. These mechanisms include direct strategies for problem resolution, cognitive reevaluation, acceptance, and social support rather than nonadaptive alternatives, such as avoidance, denial, or emotional thought (Compas, 2006). Coping functions include the ability to evaluate situations and make the best decision possible, and some authors have postulated that coping is intimately linked to cognitive function. Because of this, impairments in the integrity of these mechanisms could be associated with inefficient coping strategies.

Childhood abuse and neglect create neurodevelopmental toxicity that consequently impairs all of the functions that are intimately linked to cognitive function, including coping skills (Barker-Collo, Read, & Cowie, 2012; Del-Ben, Vilela, de Crippa, Hallak, Labati, & Zuardi, 2001; Grassi-Oliveira et al., 2008; Sesar, Simic, & Barisic, 2010). As a result, abused and neglected individuals may likely use less adaptive forms of stress management and infrequently use coping strategies that focus on the resolution of problems. The objective of the present study was to verify the existence of an association between CMT and coping strategies in individuals with BD Type 1.

Methods

Female outpatients with BD Type 1 and without psychiatric comorbidities, aged 18 to 65 years, were selected from an outpatient unit of the Hospital Materno-Infantil Presidente Vargas in Porto Alegre, Brazil. The diagnoses of BD and comorbidities were confirmed using the Semi-structured Clinical Interview for the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (SCID-I-CV; Del-Ben et al., 2001). Only euthymic patients were included, with euthymia defined as a score on the Young Mania Rating Scale ≤ 7 and 21-item Hamilton Depression Rating Scale ≤ 7 (Hamilton, 1960; Vilela, Crippa, Del-Ben, & Loureiro, 2005; Young, Biggs, Ziegler, & Meyer, 1978). Patients with diagnoses of other mental disorders, such as psychotic disorders, substance abuse or dependence, and dementia, or other organic disorders were excluded. All of the procedures for data collection were conducted by a trained research team.

Before their inclusion in the study, all of the participants provided written informed consent. The investigation protocol was approved by the ethics committee of the Hospital Materno-Infantil Presidente Vargas and Pontifícia Universidade Católica do Rio Grande do Sul.

Coping

Coping was evaluated using the Brazilian-Portuguese versions of the Ways of Coping Questionnaire (WCQ) and Brief COPE, two self-applied instruments. The WCQ (Folkman et al., 1986; Seidl, Tróccoli, & Zannon, 2001) comprises a set of 45 items, in which the frequency of use of different coping strategies is presented in a Likert format, from 1 ("I never do this") to 5 ("I always do this"). The participant is asked to select a specific stress-related event and, using a 5-point Likert-type scale, indicate how he would respond to that event. The coping strategies are divided into four factors: (*i*) focused on the problem (i.e., active efforts to manage, cope, solve, or reappraise the problem), (*ii*) focused on emotion (i.e., efforts to regulate the emotional states associated with the stressor as a way to reduce emotional discomfort without the objective to solve the problem; these include emotional reactions, such as rage, anxiety, guilt, avoidance, and passive behavior), (*iii*) religious or fantastic thought (i.e., religious behavior, thoughts, and faith that help when coping with problems), and (*iv*) search for social support (i.e., actively search for information or emotional support).

The Brief COPE (Carver, 1997; Ribeiro, & Rodrigues, 2004) is a Likert-type, self-applied instrument that consists of a set of 28 items that cover 14 coping styles in the original version and nine coping styles in the Portuguese version. The individual is asked how he managed stressful situations, from 0 ("I never did this") through 3 ("I did this a lot"). After factorial analysis with samples of BD patients, the original 14 factors were grouped into three independent factors: (*i*) focused on the problem (i.e., active coping, planning positive reinterpretation, acceptance, and search for instrumental, emotional, and social support), (*ii*) adaptive and focused on emotion (i.e., apply strategies of self-distraction, humor, expression of feelings, and religious thought), and (*iii*) maladaptive and focused on emotion (i.e., use of a substance to cope, such as alcohol and drugs, denial, guilt, and behavioral disengagement). This factorial regrouping was performed with the objective of adapting the results to the theoretical constructs proposed by the authors.

Childhood maltreatment

A history of CMT was evaluated using the Childhood Trauma Questionnaire (CTQ; Grassi-Oliveira, Stein, & Pezzi, 2006). The CTQ is a self-applied instrument that evaluates the impact of traumatic events that occurred in adolescents and adults during childhood. The CTQ is a set of 28 items that investigates five subscales of traumatic events: (*i*) physical abuse, (*ii*) emotional

abuse, (*iii*) sexual abuse, (*iv*) physical neglect, and (*v*) emotional neglect. The questionnaire is presented in a Likert-type scale that represents how frequently events were experienced, from 1 (Never) to 5 (significant frequency or always), resulting in a score from 5 to 25 for each of the five components of the scale. In the present study, the cutoffs adopted were proposed by the cohort of Walker et al. (1999) and intended to identify a positive history of CMT (Walker et al., 1999).

Statistical analyses

A one-sample Kolmogorov-Smirnov test was used to test the normality of all of the continuous variables. To elucidate relationships between the factors of the WCQ and Brief COPE and between coping factors and CMT, Pearson's correlation test was performed. In this case, for variables that were not normally distributed, Spearman's correlation test was performed. Stepwise linear regression analysis was performed to identify independent factors (CMT) associated with the coping factors of the WCQ and Brief COPE. Values of $p < .05$ were considered statistically significant. The data were analyzed using SPSS version 16.0 (SPSS, Chicago, IL, USA).

Results

Thirty female patients with BD Type 1 were included in the study. The demographic variables, distributions of coping strategies, and histories of CMT are presented in Table 1.

Table 1. Description of the sample ($n = 30$).

	Mean (SD)
Clinical and Demographic Data	
Age (years)	43.77 (12.36)
Age of first mood episode (years)	26.07 (11.23)
Duration of illness (years)	17.6 (10.65)
Number of episodes	4.75 (3.32)
Number of hospitalizations	3.77 (4.5)
HAM-D (21-item) score	5.57 (4.7)
YMRS score	2.9 (3.88)
Childhood Maltreatment	
Components of CTQ (5-25)	
Emotional abuse	14.96 (5.67)
Emotional neglect	13.63 (5.24)
Physical abuse	10.86 (5.53)
Physical neglect	9.63 (4.46)
Sexual abuse	7.43 (4.40)
Total CTQ (25-125)	56.53 (18.67)
Coping	
WCQ (1-5)	
Religious or fantastic thoughts	3.32 (.76)
Focused on the problem	3.06 (.67)
Focused on emotion	2.98 (.77)
Search for emotional support	2.76 (.84)
Brief COPE (0-3)	
Focused on the problem	1.65 (.59)
Adaptive and focused on emotion	1.51 (.58)
Maladaptive	1.12 (.49)

HAM-D, Hamilton Depression Rating Scale; YMRS, Young Mania Rating Scale; CTQ, Childhood Trauma Questionnaire; WCQ, Ways of Coping Questionnaire.

Emotional abuse was the most frequent type of CMT in the sample, with 80% of the individuals reporting some type of emotional abuse during childhood. More than half of the females reported a history of physical abuse and neglect (66.7% and 63.3%, respectively). Emotional neglect during childhood was found in 43.3% of the individuals, and 26.7% of those individuals reported sexual abuse.

The use of fantastic thoughts or religious practices was the most frequent modality for coping measured by the WCQ, which was used by two-thirds of the sample. A similar frequency was found using the Brief COPE. The WCQ indicated that 56% of the patients frequently used strategies that were focused on managing specific stressors, with responses including "sometimes," "frequently," and "always." Forty-six percent of the strategies were focused on emotion, and 33% were focused on the search for social support. The most frequently used coping styles (i.e., "sometimes" and "frequently") for individuals assessed using the Brief COPE were focusing on the problem (66.7%) and focusing on emotion (46.7%). The maladaptive style of coping was the least frequent style used by the individuals in the sample (16.7%).

Coping measurements: ways of coping questionnaire and brief COPE

The regrouping of the 14 original factors of the Brief COPE into three factors that showed similarities to the WCQ is presented in Table 2. The two factors of the Brief COPE that suggested styles of adaptive coping were found to be associated with the WCQ factors "focused on the problem" and "religious or fantastic thought." The search for social support was inversely associated with coping strategies focused on emotion. Maladaptive coping and a focus on emotion were directly related to the WCQ's coping strategy that focused on emotion.

Table 2. Correlation between factors of the WCQ and Brief COPE.

		Brief COPE		
		Focused on the problem	Adaptive and focused on emotion	Maladaptive and focused on emotion
WCQ	Focused on the problem	.39 [b]	.49 [a]	-.39 [b]
	Focused on emotion	-.53 [a]	-.07	.54 [a]
	Fantastic or religious thoughts	.13	.41 [b]	-.00
	Search for social support	.38 [b]	.20	.03

WCQ, Ways of Coping Questionnaire; Pearson Correlation, [a]$p \leq .01$, [b]$p \leq .05$.

Coping and childhood maltreatment

Table 3 shows the results of the associations between coping and a history of CMT in the exploratory correlational analysis. The severity of CMT was generally positively associated with a preference for

Table 3. Exploratory analysis between coping and childhood maltreatment (n = 30).

	Total CTQ *	Physical neglect *	Emotional neglect *	Sexual abuse **	Physical abuse *	Emotional abuse *
WCQ						
Focused on the problem	-.31	-.02	-.53 [a]	.40 [b]	-.45 [b]	-.34
Focused on emotion	.42 [b]	.20	.28	.19	.33	.44 [b]
Fantastic and religious thought	-.13	-.09	-.29	.43 [b]	-.18	-.10
Search for social support	-.01	.04	-.29	.38 [b]	-.06	-.70
Brief COPE						
Focused on the problem	-.42 [b]	-.25	-.49 [a]	.02	-.29	-.34
Adaptive and focused on emotion	-.52 [a]	-.46 [a]	-.48 [a]	.02	-.48 [a]	-.44 [b]
Maladaptive and focused on emotion	.60 [a]	.36 [b]	.55 [a]	.13	.64 [a]	.44 [b]

WCQ, Ways of Coping Questionnaire. *Pearson Correlation,**Spearman Correlation, [a]$p \leq .01$, [b]$p \leq .05$.

coping styles and strategies that centered on emotional reactions rather than on more adaptive coping strategies that focused on problem-solving.

The pattern of coping as related to emotional expression was associated with a history of neglect (physical or emotional) and physical and emotional abuse. Additionally, the use of coping strategies that focused on the problem was negatively associated with the presence of physical abuse and emotional neglect.

The use of adaptive coping strategies and styles that focus on emotion, evaluated by the Brief COPE, showed an inverse relationship with the severity of CMT, especially with regard to emotional neglect, whereas the presence of childhood sexual abuse was related only to an adaptive pattern of coping measured by the WCQ.

The objective of the present study was to evaluate the impact of the severity of CMT on the preference for coping styles and strategies, for which a multiple regression analysis was conducted (Tables 4 and 5). Each factor of the WCQ and Brief Cope was included as a dependent variable in the equations, and the subscales of the CTQ were considered independent variables. The subscale for sexual abuse was excluded from the regression because its results did not present a normal distribution with strong positive asymmetry.

A linear relationship was found between the frequency of emotional neglect during childhood on the WCQ and the decreased use of coping strategies that focused on the problem (Table 4). Similarly, the severity of emotional abuse was directly proportional to the frequency of using coping strategies that focused on emotional control.

Table 5 shows a similar linear regression, but it included data from the Brief COPE. Participants who were subjected to physical abuse during childhood presented coping styles that appeared to depend on the frequency and severity of abuse. More importantly, however, is the frequent use of maladaptive coping strategies that focused on emotion rather than the less frequent use of adaptive coping strategies. The frequency of emotional neglect during childhood was found to be a significant predictor of the infrequent implementation of coping strategies that focused on a resolution of the stressor.

Table 4. Linear regression: Coping (WCQ) and history of childhood maltreatment.

	R	ΔR^2	ΔF	*df*	*B*	*p*
Focused on the problem	.53	.25	11.08	1.29		.002
Physical neglect					.33	ns
Emotional neglect					-.53	.002
Physical abuse					-.14	ns
Emotional abuse					.07	ns
Focused on emotion	.44	.16	6.78	1. 29		.01
Physical neglect					-.00	ns
Emotional neglect					-.05	ns
Physical abuse					.10	ns
Emotional abuse					.44	.01
Fantastic or religious thought	.33	-.03	.78	4.29		ns
Search for social support	.42	.05	1.40	4.29		ns

. ns, nonsignificant; WCQ, Ways of Coping Questionnaire.

Discussion

The present results support the hypothesis that traumatic events during childhood negatively interfere with the way adult individuals with BD cope with stress. Bipolar patients who were subjected to CMT, especially physical neglect and physical abuse, presented a preference for coping styles and strategies that focused on emotional control and were associated with the cognitive reappraisal of problems and strategies that included the avoidance of coping. Furthermore, the styles and strategies associated with problem solving were less frequently used in the subpopulation of BD patients who were subjected to CMT.

Table 5. Linear regression: Coping (Brief COPE) and history of childhood maltreatment.

	R	ΔR^2	ΔF	*df*	*B*	*p*
Focused on the problem	.49	.22	9.20	1. 29		.005
Physical neglect					.00	ns
Emotional neglect					-.49	.005
Physical abuse					.12	ns
Emotional abuse					.02	ns
Adaptive and focused on emotion	.48	.21	8.76	1.29		.006
Physical neglect					-.31	ns
Emotional neglect					-.28	ns
Physical abuse					-.48	.006
Emotional abuse					-.23	ns
Maladaptive and focused on emotion	.64	.39	19.6	1.29		.000
Physical neglect					.11	ns
Emotional neglect					.18	ns
Physical abuse					.64	.004
Emotional abuse					.08	ns

ns, nonsignificant

One important aspect is the difference between the instruments used to evaluate coping. The WCQ is applied based on one specific stressor chosen by the patient and is based on the model of coping strategies by Folkman et al. (1986). This approach provides evidence of the way the individual copes with a specific problem. The Brief COPE, in contrast, evaluates the most common way to cope with stressors (coping traits or coping styles; Carver, Scheier, & Weintraub, 1989). Both concepts evaluated by WCQ and Brief COPE were similar showing association with CMT.

Reducing the 14 factors from the Brief COPE to three factors was compatible with the theoretical framework presented by the WCQ. An important difference between these two instruments is the strategies that focus on emotion. In the WCQ, the factor "coping focused on emotion" combines several strategies related to emotional control, such as anger and guilt, which imply intrinsic dysfunctional characteristics. In the Brief COPE, the authors considered that certain strategies (e.g., humor and distraction) are functional despite being focused on emotion. Because of this, a specific factor for those strategies was created.

Furthermore, the present results are consistent with previous studies that used samples from different populations. Walsh, Fortier, & Dilillo (2010) found a relationship between a history of childhood sexual abuse and emotion-oriented coping in a sample of university students. Sesar et al. (2010) and Hager, & Runtz (2012) studied coping and CMT and proposed that avoidance and denial strategies are among the more common coping strategies.

Our hypothesis suggests that the relationship between CMT and dysfunctional coping is based on the impact of severe stress during critical periods of neurodevelopment, thus impairing cognition and affecting memory (Ritchie et al., 2011), attention, and executive function (Savitz et al., 2008). These findings are corroborated by structural neuroimaging studies that described volumetric reductions of the hippocampus (Bremner et al., 1997; Stein et al., 1997; Woon, & Hedges, 2008). Additionally, the size of the amygdala was found to be reduced in a pediatric population who was exposed to maltreatment (Weniger, Lange, Sachsse, & Irle, 2008), although increased activity was also found (Grant, Cannistraci, Hollon, Gore, & Shelton, 2011). Moreover, the mediators involved in the neuroprogression of BD, such as inflammation and neurotrophic factors (Berk, 2011), may be influenced by CMT. In fact, CMT is associated with reprogramming of the release of brain-derived neurotrophic factor (Elzinga, 2011), and a close association between traumatic events and cytokines has been observed (Guo, 2012).

The hippocampus, amygdala, and prefrontal cortex may be vulnerable to several secondary mechanisms that may compromise their functionality, resulting in difficulties in coping strategies that depend on the integrity of certain cognitive processes, particularly processes related to the resolution of problems and cognitive reappraisal, such as executive function, all of which depend on the prefrontal cortex (Clark, Rogers, Armstrong, Rakowski, & Kviz, 2008; Funahashi, 2001; Tanji, & Hoshi, 2008). Additionally, the activity of the amygdala, in association with the prefrontal cortex, can modulate emotional responses to ensure that behavior is appropriate for the specific context (Bachevalier, & Malkova, 2006; Garrett, & Chang, 2008). Individuals with amygdalar hyperactivity associated with prefrontal dysfunction exhibited behaviors and thoughts with more emotional characteristics when dealing with stressors (i.e., coping strategies focused on emotion).

Based on the present results, we hypothesize that BP patients exposed to CMT will use less adaptive strategies in a probable stressful situation in the future, rather than strategies directed toward problem resolution. Therefore, BP patients will tend to experience the stressor in a more negative way, thereby increasing the activation of the mediators involved in the neurophysiology of stress (Bender et al., 2010; Kauer-Sant'Anna et al., 2007) and allostatic load (Kapczinski et al., 2008). These facts can postulate the moderating role of coping between CMT and bipolar disorder progression. Thus, a new focus for psychosocial interventions may be introduced that is centered on readjusting coping strategies to relieve the progressive nature of the disorder (Grassi-Oliveira, Daruy-Filho, & Brietzke, 2010).

The limitations of the present study include the small sample size and its restriction to women. More studies are necessary to elucidate specific cognitive processes associated with coping strategies and the neuroanatomical and neurofunctional processes impacted by traumatic events during childhood that affect the strategies chosen by an individual. Moreover,

prospective studies may investigate individual differences in coping abilities as a modulator of the impact of CMT on BD.

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