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Dispositional Mindfulness, Posttraumatic Stress Disorder Symptoms and Academic Burnout in Chinese Adolescents Following a Tornado: The Role of Mediation through Regulatory Emotional Self-Efficacy

Guangzhe Yuan, Wei Xu, Zhen Liu, Chaoyi Liu, Wen Li, and Yuanyuan An

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ABSTRACT
Limited research has been conducted on dispositional mindfulness, posttraumatic stress disorder (PTSD) symptoms and academic burnout in Chinese adolescents following a tornado. The present study investigated the ways in which dispositional mindfulness is related to PTSD symptoms and academic burnout in Chinese adolescents following a tornado by considering the role of regulatory emotional self-efficacy. A total of 431 Chinese adolescents (mean age: 14.75 years) who had experienced a severe tornado 9 months prior to this study were recruited for this study. The results indicated that our model fit the data well ($\chi^2/df = 2.774$, CFI = 0.952, TLI = 0.934, RMSEA (90% CI) = 0.064 (0.051 – 0.077)), and revealed that regulatory emotional self-efficacy partially mediates the relationships between dispositional mindfulness and PTSD symptoms and academic burnout, respectively. The clinical implications and limitations of our research, and recommendations for future research, are discussed in this paper.

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KEYWORDS
Academic burnout; dispositional mindfulness; mediation; posttraumatic stress disorder; regulatory emotional self-efficacy

A tornado is one of the most intensely destructive storms in nature (Lee & Wurman, 2005). On June 23, 2016, a devastating tornado struck Yancheng, China. The disaster progressed rapidly within a day, and left the city destroyed. It is estimated that the tornado killed 99 people while injuring approximately 800, and affecting more than 1.6 million have been affected (Lyu, Wang, Cheng, & Shen, 2017). Beyond the physical, environmental, and economic toll of this tornado, catastrophic disasters such as this event, cause mental health problems for individuals who experience the disaster directly, or who live in the affected community (Houston et al., 2015). In a review of 160 disaster studies, Norris et al. (2002) concluded that youth were at greater risk than adults from mental health problems following a traumatic event. Therefore, as young victims, children and adolescents are in greatest need of help and support.

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Posttraumatic stress disorder (PTSD)

Although other reactions such as depression, anxiety, and behavioral problems may occur, the most commonly studied reaction following traumatic events is PTSD (Trickey, Siddaway, Meiser-Stedman, Serpell, & Field, 2012). PTSD is a common psychiatric disorder following traumatic events that cause intense fear, helplessness, or loss (Jin, Liu, & Guan, 2015). Estimates of the prevalence of PTSD in children and adolescents who have experienced trauma vary widely (Gillies, Taylor, Gray, O’Brien, & D’Abrew, 2013). Using a sample of 548 high school student survivors after the Wenchuan earthquake, Zhang et al. (2012) found that the rate of PTSD symptoms was 9.7% at the 6-month follow-up. In Wang et al.’s (2012) study, the prevalence rate of a high-risk for PTSD was 28.4% in a sample of 1841 junior middle school student survivors ten months after the Wenchuan earthquake. Moreover, in a systematic review of natural disaster studies, Neria and colleagues (2008) found that the prevalence of PTSD among individuals who had directly experienced a disaster ranged from 30% to 40%, while the prevalence of PTSD in the general population in an area where a disaster had occurred ranged from 5% to 6%.

Academic burnout

As with PTSD symptoms, considerable attention has been paid to adolescents’ academic burnout following trauma (Xu et al., 2017; Ying, Wang, Lin, & Chen, 2016). Academic burnout can be characterized by emotional exhaustion from study demands, possession of detached attitudes toward academic tasks, and perceptions or displays of reduced efficiency or academic competence (Maslach, Schaufeli, & Leiter, 2001). It may be particularly prevalent among adolescents exposed to natural disasters since experiencing stressful life events is one of its important risk factors (Lin & Huang, 2014; Mather, Blom, & Svedberg, 2014). Lin et al. (2013) claimed that 828 primary and secondary school students reported academic burnout especially the impairment in learning self-efficiency at 30 months after the 2008 Wenchuan earthquake. Similarly, Wu and his colleagues (2009) found that many students reported varying degrees of academic burnout within the area of the Wenchuan earthquake. However, the experience of disasters does not affect everyone the same way (Birkeland, Hansen, Blix, Solberg, & Heir, 2017). Hence, it is important to explore the potential protective factors of academic burnout following exposure to natural disasters. In the current study, we examined the role of dispositional mindfulness as one potential protective factor in a sample of adolescents in Yancheng following the 2016 Jiangsu tornado.
Dispositional mindfulness and PTSD

One candidate variable that is likely to be associated with PTSD symptoms is mindfulness. Considerable attention has also been paid to mindfulness following trauma (e.g. Chopko & Schwartz, 2009; Follette, Palm, & Pearson, 2006; Thompson, Arnkoff, & Glass, 2011). Mindfulness has been scientifically defined by some researchers as the ability to focus attention on the experiences and actions of the present moment in a non-judging, open and curious manner that involves detaching from the identification with these experiences – such as psychological or somatic symptoms or negative emotions (Bishop et al., 2004). As one’s state of mindfulness may be unstable and sensitive to change, dispositional mindfulness is more frequently assessed in the literature and refers to one’s general tendency to be able to attend to the present moment nonjudgmentally and purposefully (Brown & Ryan, 2003). A stress-buffering hypothesis of mindfulness posits that mindfulness mitigates stress appraisals and reduces stress reactivity responses, and that the effects of stress reduction partly or completely explain how mindfulness is linked with mental and physical health outcomes (Creswell, 2014). Consistent with this viewpoint, mindfulness may be a protective factor for PTSD. Preliminary evidence has pointed to the negative relationship between dispositional mindfulness and PTSD symptoms (Thompson et al., 2011). For example, self-reported dispositional mindfulness has been found to be inversely associated with PTSD symptoms in college students (Thompson et al., 2011). A meta-analysis showed that mindfulness-based intervention programs were effective in ameliorating posttraumatic stress symptoms (Hopwood & Schutte, 2017). In addition, many researchers found that dispositional mindfulness was associated with mental health problems (Boden et al., 2012; Boughner, Thornley, Kharlas, & Frewen, 2016; Hagen, Lien, Hauff, & Heir, 2016; Smith et al., 2011; Thompson & Waltz, 2010). Thus, in our opinion, dispositional mindfulness may predict PTSD symptoms in a sample of Chinese adolescent survivors following a severe trauma.

Dispositional mindfulness and academic burnout

Even though the protective role of mindfulness in reducing burnout and posttraumatic symptoms has been shown (separately) in past research (Cohen-Katz, Wiley, Capuano, Baker, & Shapiro, 2005; Flook, Goldberg, Pinger, Bonus, & Davidson, 2013; Thompson & Waltz, 2010), few studies have examined the relationship between traumatic adolescents’ dispositional mindfulness and academic burnout. To our knowledge, Xu et al.’s (2017) study is the only study concerning the association between dispositional mindfulness and academic burnout. This study concluded that dispositional mindfulness can negatively predict academic burnout in a sample of 247
Chinese adolescents. Similarly, using a sample of 233 adolescent athletes, Gustafsson and his colleagues (2015) found that dispositional mindfulness was negatively associated with burnout, and that this association was mediated by increment in positive affect. Therefore, in the current study, we explore a more complex model based on the relationship between dispositional mindfulness and academic burnout.

**Dispositional mindfulness, regulatory emotional self-efficacy, PTSD, and academic burnout**

Traditionally, self-efficacy beliefs have been conceptualized as reflecting highly contextualized knowledge that affects appraisal processes, which in turn guide actions (Alessandri, Vecchione, & Caprara, 2015). More recently, theoretical and empirical efforts were made to assess perceived self-efficacy on a broader level than the task-specific level commonly used in prior analyses of self-efficacy beliefs (Caprara, 2002). Given that regulatory emotional self-efficacy has proven to be an important contributor to success in a variety of domains, it is likely to be critical in mastering successfully the various task demands, risks, and challenges in the passage through adolescence to adulthood (Caprara et al., 1998). Indeed, regulatory emotional self-efficacy beliefs entail a subjective self-appraisal of one’s own emotional competence in the domain of emotion regulation (Alessandri et al., 2015).

Furthermore, the aim of the current study was also to test a potential mechanism underlying the relationship among mindfulness, regulatory emotional self-efficacy, PTSD symptoms and academic burnout among traumatized adolescents following a tornado. As mindfulness is essentially a quality of consciousness, we proposed that dispositional mindfulness may shape individual differences in cognitive appraisal (Salmon, Sephton, & Dreeben, 2011), specifically, the endorsement of certain attitudes or beliefs, following traumatic experiences. From the perspective of the Gross’s model of emotion regulation (1998, 2014), mindfulness appears to represent primarily an attention deployment approach to emotion regulation (Brown & Ryan, 2003; Wadlinger & Isaacowitz, 2011). It has been proposed that mindfulness might be an important emotional emotion-regulation strategy that sustains positive emotion and decreases negative emotion (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Goldin & Gross, 2010; Hayes & Feldman, 2004). Mindfulness has also been found to positively predict self-regulatory self-efficacy (Caldwell, Harrison, Adams, Quin, & Greeson, 2010), counseling self-efficacy (Greason & Cashwell, 2009), and well-being (Soysa & Wilcomb, 2015).

Further support for our hypotheses stem from both research on regulatory emotional self-efficacy, PTSD symptoms, and academic burnout: First, self-regulation shift theory (SRST) suggests that certain individuals
following trauma will experience a critical threshold where their perception of self-determination moving forward is shattered (Benight, Shoji, & Delahanty, 2017). This “breaking point” results in a drastic negative shift in functioning (Benight et al., 2017). The new state is experienced as an “impaired self” leading to elevated levels of posttraumatic stress symptoms, chaotic coping, and a major drop in perceived capability to manage posttraumatic stress demands. Second, the level of perceived self-efficacy was associated with the level of PTSD symptoms in traumatized adolescents (Diehl & Prout, 2002; Ferren, 1999), and longitudinal studies indicated there were large effects of self-efficacy on general distress and PTSD symptom severity (Luszczynska, Benight, & Cieslak, 2009). Third, individuals with high level of burnout tend to adopt negative self-evaluations (Lian, Sun, Ji, Li, & Peng, 2014), low level of self-efficacy (Skaalvik & Skaalvik, 2010), maladaptive cognitive styles (Zhang, Gan, & Cham, 2007), and negative core beliefs (Ni & Wu, 2009), which showed that there would be a relationship between regulatory emotional self-efficacy, PTSD symptoms, and academic burnout. These appraisals would, in turn, support the mediating effect of regulatory emotional self-efficacy in the relation between PTSD symptoms and academic burnout among traumatized adolescents.

**The current study**

There were two aims of this study: first, we sought to describe the association between dispositional mindfulness, regulatory emotional self-efficacy, PTSD and academic burnout; and second, we wished to identify the possible mediating role of regulatory emotional self-efficacy in the relationships between dispositional mindfulness and PTSD and academic burnout. This role was examined in the current study using a sample of 431 Chinese adolescents. Participants were middle school students in Yancheng, China, who had just experienced a major tornado 9 months before the current study. Based on the empirical and theoretical evidence discussed earlier in this manuscript, we hypothesized that: (1) dispositional mindfulness and regulatory emotional self-efficacy are both negatively correlated with PTSD symptoms; (2) that dispositional mindfulness and regulatory emotional self-efficacy are both positively correlated with academic burnout; and (3) that regulatory emotional self-efficacy mediates the relationships between dispositional mindfulness and PTSD and academic burnout. In addition, mediation tests were conducted using the resulting model.
Method

Participants and procedures

The participants in the study were adolescents from two middle schools in Yancheng, Jiangsu, China, where the tornado took place. A total of 435 adolescents were recruited nine months after the tornado occurred. Excluding the invalid answers from 4 participants, data from 431 participants were available for analysis. The mean age of the participants was 14.75 (standard deviation [SD] = 1.022), with 179 (41.5%) being boys. Among the 431 participants, 133 (30.8%) had seen their houses damaged, including 3 houses that were destroyed completely. Nine of the participants were trapped when the tornado came, and six were injured. Also, 78 (18.1%) of the participants’ relatives or friends were trapped, and eighty (18.6%) of the participants’ relatives or friends were injured. Twenty-seven (6.3%) of the participants’ relatives or friends died.

This study was approved by the Ethic Committee of the School of Psychology, Nanjing Normal University and written informed consent was obtained from school principals and classroom teachers. The questionnaires were completed class by class, and participant classes were randomly selected in each school. Students completed the pencil-and-paper questionnaires in quiet classrooms, and it took them approximately 20 minutes to finish all of them. After that, the researchers conducted a 10-minute-long group games session as the reward for their involvement.

Measures

Mindfulness Attention Awareness Scale (MAAS)

Dispositional mindfulness was measured by the Chinese version of the MAAS (Deng et al., 2012). The original MAAS (Brown & Ryan, 2003) is a widely used scale to assess an individual’s dispositional mindfulness. It had 15 items each rated on a 6-point scale from 1 (always) to 6 (never). Examples of the items included: “I find myself doing things without paying attention,” “I find it difficult to stay focused on what’s happening in the present,” “I rush through activities without being really attentive to them.” All items were reversely scored to compute a composite score such that higher scores indicate higher levels of dispositional mindfulness. This scale has shown good reliability and construct validity in an adolescent sample (Black, Sussman, Johnson, & Milam, 2012). In this sample, the scale demonstrated good internal consistency (α = .90).
Regulatory emotional self-efficacy questionnaire (RESEQ)

The RESEQ is a 12-item scale developed in a Chinese student sample to assess Regulatory Emotional Self-Efficacy (Tian, 2012). Items were rated on a 5-point scale ranging from 1 (very poor) to 5 (very good). The RESEQ includes four subscales: perceived self-efficacy in feeling positive affect (POS), perceived self-efficacy in regulating positive affect (MPOS), perceived self-efficacy in regulating despondency/distress (DES), perceived self-efficacy in regulating anger/irritation (ANG). Examples of the items included: “How well can you rejoice over your successes,” “How well can you keep from getting dejected when you are lonely,” “How well can you get over irritation quickly for wrongs you have experienced.” In this sample, the scale demonstrated good internal consistency (α = .81).

The Child PTSD Symptom Scale (CPSS)

PTSD symptom levels were measured using the CPSS (Foa, Johnson, Feeny, & Treadwell, 2001), which is a 17-item self-report measure designed to evaluate DSM-IV PTSD symptoms on occurrence and frequency. This scale was applied to the Chinese population (Ying, Wu, & Chen, 2013; Ying, Wu, Lin, & Jiang, 2014). In the current study, all these items were translated into Chinese. Participants rated their current experiences of PTSD symptoms during the previous two weeks on a 4-point Likert scale ranging from 0 (not at all/only once) to 3 (almost always). The subscale scores range from 0 to 15 for intrusion symptoms (e.g., “I have nightmares”), 0–21 for avoidance symptoms (e.g., “I lost interests in many things that I enjoyed doing”), and 0–15 for hyperarousal symptoms (e.g., “I have trouble falling or staying asleep”). An overall severity score was generated by summing the scores for the three symptom types. In this sample, the scale demonstrated good internal consistency (α = .87).

Learning burnout questionnaire (LBQ)

The LBQ is a 21-item scale developed in a Chinese student sample to assess academic burnout (Hu & Dai, 2007). Items were rated on a 5-point scale ranging from 0 (not at all) to 4 (almost always). The LBQ includes four subscales: mental exhaustion, the lack of personal learning accomplishment, the alienated relationship between students and teachers, and physical exhaustion. Examples of the items included: “I don’t care whether I finished my homework,” “I have poor sleep,” “I don’t want to study.” Higher scores indicated greater severity of academic burnout. In this sample, the scale demonstrated good internal consistency (α = .82).
Data analysis

Only 0.77% of the data was missing. Little’s Missing Completely at Random (MCAR) test suggested that the rate of missing data was equivalent across all measures \((p > 0.05)\). Means, SD, Cronbach’s alpha coefficients, and correlations of the four scales in the current study were computed by SPSS 22.0. AMOS 21.0 was adopted to test the hypothesized model and mediation effects.

Results

The Harman’s single-factor test was applied initially to examine common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). All items relevant to the study were subjected to an exploratory factor analysis, and the unrotated factor solution was examined to determine the number of factors that are necessary to account for the overall variance. This procedure suggested no single factor accounted for the majority of the covariance among the variables. Therefore, no significant common method bias existed in the current study.

Means, SD, and Cronbach’s alpha coefficients of the measures are shown in Table 1. All the measures have good or acceptable reliability. Table 1 also shows significant correlations between dispositional mindfulness, regulatory emotional self-efficacy, PTSD symptoms and academic burnout.

Maximum likelihood was used to test the hypothesized model. In the model, mindfulness was the observed variable, while regulatory emotional self-efficacy, PTSD symptoms and academic burnout were the latent variables consisting of the observed variables including intrusion, avoidance and hyper-arousal; perceived self-efficacy in feeling positive affect, perceived self-efficacy in regulating positive affect, perceived self-efficacy in regulating despondency/distress and perceived self-efficacy in regulating anger/irritation; mental exhaustion, the lack of personal learning accomplishment, the alienated relationship between students and teachers and physical exhaustion, respectively. Due to the relatively high correlations, intrusion was correlated to avoidance and hyper-arousal; perceived self-efficacy in feeling positive affect was correlated to perceived self-efficacy in regulating positive affect; perceived self-efficacy in regulating despondency/distress and perceived self-efficacy in regulating anger/irritation; mental exhaustion was correlated to the lack of personal learning accomplishment, the alienated relationship between students and teachers and physical exhaustion in the model.

Results revealed that the model had good fitness to the data, \(\chi^2/df = 2.774\), CFI = 0.952, TLI = 0.934, RMSEA (90% CI) = 0.064 (0.051–0.077). Figure 1 shows the path coefficients of the model. All path coefficients were statistically significant. Bootstrap analyses showed that the relationship between mindfulness and
Table 1. Means, SD, Cronbach’s alpha coefficients, and correlations of variables (N = 431).

<table>
<thead>
<tr>
<th></th>
<th>M ± SD</th>
<th>α</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mindfulness</td>
<td>64.32 ± 15.06</td>
<td>.90</td>
<td>−.360***</td>
<td>−.531***</td>
<td>−.576***</td>
<td>−.464***</td>
<td>−.116*</td>
<td>−.482***</td>
<td>−.529***</td>
<td>.226***</td>
<td>.235***</td>
<td>.105*</td>
<td>.285***</td>
</tr>
<tr>
<td>2.</td>
<td>PTSD_Int</td>
<td>2.80 ± 2.45</td>
<td>.73</td>
<td>−.360***</td>
<td>−.532***</td>
<td>.160**</td>
<td>−.099*</td>
<td>.186***</td>
<td>.281***</td>
<td>−.122*</td>
<td>−.144**</td>
<td>−.061</td>
<td>−.172***</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>PTSD_Avo</td>
<td>4.88 ± 3.22</td>
<td>.71</td>
<td>−.531***</td>
<td>.564***</td>
<td>−.638***</td>
<td>.360***</td>
<td>.042</td>
<td>.365***</td>
<td>.385***</td>
<td>−.193***</td>
<td>−.206***</td>
<td>−.115*</td>
<td>−.270***</td>
</tr>
<tr>
<td>4.</td>
<td>PTSD_Hyp</td>
<td>4.53 ± 2.88</td>
<td>.71</td>
<td>−.575***</td>
<td>.540***</td>
<td>.644***</td>
<td>−.452***</td>
<td>.100*</td>
<td>.437***</td>
<td>.542***</td>
<td>−.188***</td>
<td>−.209***</td>
<td>−.085</td>
<td>−.292***</td>
</tr>
<tr>
<td>5.</td>
<td>AB_Ment</td>
<td>9.36 ± 6.55</td>
<td>.85</td>
<td>−.477***</td>
<td>.166**</td>
<td>.364***</td>
<td>.457***</td>
<td>−.312***</td>
<td>.647***</td>
<td>.695***</td>
<td>−.202***</td>
<td>−.135***</td>
<td>−.151**</td>
<td>−.243***</td>
</tr>
<tr>
<td>6.</td>
<td>AB_Lack</td>
<td>10.63 ± 5.18</td>
<td>.85</td>
<td>−.118*</td>
<td>−.108*</td>
<td>.034</td>
<td>.098</td>
<td>.308***</td>
<td>−.201***</td>
<td>.254***</td>
<td>−.126**</td>
<td>−.124**</td>
<td>−.178***</td>
<td>−.159**</td>
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<tr>
<td>7.</td>
<td>AB_Alien</td>
<td>4.95 ± 3.70</td>
<td>.76</td>
<td>−.486***</td>
<td>.186***</td>
<td>.365***</td>
<td>.436***</td>
<td>.647***</td>
<td>.202***</td>
<td>−.614***</td>
<td>−.046</td>
<td>−.139***</td>
<td>−.065</td>
<td>−.216***</td>
</tr>
<tr>
<td>8.</td>
<td>AB_Phys</td>
<td>4.47 ± 3.76</td>
<td>.74</td>
<td>−.537***</td>
<td>.286***</td>
<td>.391***</td>
<td>.546***</td>
<td>.701***</td>
<td>.253***</td>
<td>.616***</td>
<td>−.117*</td>
<td>−.201***</td>
<td>−.101*</td>
<td>−.228</td>
</tr>
<tr>
<td>9.</td>
<td>RESE_POS</td>
<td>11.11 ± 3.22</td>
<td>.70</td>
<td>.234***</td>
<td>−.120*</td>
<td>−.191***</td>
<td>−.187***</td>
<td>−.213***</td>
<td>−.132**</td>
<td>−.052</td>
<td>−.125**</td>
<td>−.164**</td>
<td>.293***</td>
<td>.193***</td>
</tr>
<tr>
<td>10.</td>
<td>RESE_DES</td>
<td>9.07 ± 3.50</td>
<td>.71</td>
<td>.227***</td>
<td>−.158**</td>
<td>−.216***</td>
<td>−.221***</td>
<td>−.129**</td>
<td>−.106*</td>
<td>−.133**</td>
<td>−.198***</td>
<td>.152**</td>
<td>−.278**</td>
<td>.500***</td>
</tr>
<tr>
<td>11.</td>
<td>RESE_MPOS</td>
<td>10.25 ± 2.70</td>
<td>.75</td>
<td>.113***</td>
<td>−.061</td>
<td>−.116*</td>
<td>−.087</td>
<td>−.161**</td>
<td>−.180***</td>
<td>−.070</td>
<td>−.108*</td>
<td>.297***</td>
<td>.269***</td>
<td>.327**</td>
</tr>
<tr>
<td>12.</td>
<td>RESE_ANG</td>
<td>8.81 ± 2.95</td>
<td>.76</td>
<td>.284***</td>
<td>−.183***</td>
<td>−.279***</td>
<td>−.302***</td>
<td>−.243***</td>
<td>−.148**</td>
<td>−.214***</td>
<td>−.231***</td>
<td>.188**</td>
<td>.507***</td>
<td>.323***</td>
</tr>
</tbody>
</table>

Note: The number in lower left is the correlation coefficient without controlling age and gender; the number in top right is the correlation coefficient after controlling age and gender. PTSD: posttraumatic stress disorder; Int: intrusion; Avo: avoidance; Hyp: hyper arousal; AB: academic burnout; Ment: mental exhaustion; Lack: the lack of personal learning accomplishment; Alien: the alienated relationship; Phys: physical exhaustion; RESE: regulatory emotional self-efficacy; POS: perceived self-efficacy in feeling positive affect; DES: perceived self-efficacy in regulating despondency/distress; MPOS: perceived self-efficacy in regulating positive affect; ANG: perceived self-efficacy in regulating anger/irritation. ***p < .001; **p < .01; *p < .05.
PTSD symptoms was mediated by regulatory emotional self-efficacy (with the indirect effect = −0.084, 95% CI = −0.140 to −0.041), and the relationship between mindfulness and academic burnout was also mediated by regulatory emotional self-efficacy (with the indirect effect = −0.060, 95% CI = −0.143 to −0.017). The standardized direct and indirect effects are reported in Table 2 (with 95% CI using the bootstrap method).

**Discussion**

The present study investigated the relationships between dispositional mindfulness, regulatory emotional self-efficacy, PTSD symptoms, and academic burnout in adolescents following the 2016 Yancheng Tornado. The mediation of regulatory emotional self-efficacy on these relationships was also explored. Results indicate that greater dispositional mindfulness and regulatory emotional self-efficacy are both associated with lower PTSD symptoms is consistent with our first hypothesis, and that of prior research (Luszczynska et al., 2009; Thompson et al., 2011). These results support the stress-buffering hypothesis of mindfulness (Creswell, 2014).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Direct effect</th>
<th>Indirect effect</th>
<th>Total effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>95% CI</td>
<td>p</td>
</tr>
<tr>
<td>PTSD symptoms</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mindfulness</td>
<td>−.584</td>
<td>−.673/−.481</td>
<td>***</td>
</tr>
<tr>
<td>Regulatory emotional self-efficacy</td>
<td>−.232</td>
<td>−.344/−.115</td>
<td>***</td>
</tr>
<tr>
<td>Academnic burnout</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mindfulness</td>
<td>−.538</td>
<td>−.622/−.409</td>
<td>***</td>
</tr>
<tr>
<td>Regulatory emotional self-efficacy</td>
<td>−.166</td>
<td>−.339/−.040</td>
<td>***</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>.364</td>
<td>.240/.471</td>
<td>***</td>
</tr>
</tbody>
</table>

Note. CI: confidential interval; PTSD: posttraumatic stress disorder.

***p < 0.001; **p < 0.01; *p < .05.
and indicates mindfulness can play a positive role in PTSD and academic motivation among adolescents. The positive association among dispositional mindfulness, regulatory emotional self-efficacy, and academic burnout supported our second hypothesis, suggests that participants with higher level of dispositional mindfulness and regulatory emotional self-efficacy would report less academic burnout. That is consistent with previous studies (Gustafsson et al., 2015; Skaalvik & Skaalvik, 2010; Xu et al., 2017).

Furthermore, the hypothesized model fits the data well, indicating that regulatory emotional self-efficacy plays an important role in the relationship between dispositional mindfulness and PTSD symptoms and academic burnout in traumatized Chinese adolescents. Further analyses provided specific information about the mediating effects and showed that regulatory emotional self-efficacy significantly mediates the relationships between dispositional mindfulness, PTSD symptoms and academic burnout. Further, we found that regulatory emotional self-efficacy partially mediates the relationships between dispositional mindfulness, PTSD symptoms and academic burnout. This result suggests that regulatory emotional self-efficacy is not the only mediator in the relationship between dispositional mindfulness, PTSD symptoms and academic burnout, or that dispositional mindfulness itself may have a direct association with PTSD symptoms and academic burnout. Future studies, which take more potential mediators and moderators into consideration, are encouraged.

Findings from the current study may reveal the mechanisms through which dispositional mindfulness can reduce psychological symptoms and academic burnout in traumatized adolescents. Adolescents with higher levels of dispositional mindfulness are more likely to present more acceptance toward themselves, and hold a non-judgmental attitude toward the present experience (Kabat-Zinn, 2003; Thompson & Waltz, 2008). Therefore, compared with adolescents that have lower level of dispositional mindfulness, those with higher levels of dispositional mindfulness were less influenced by the tornado, and could represent better regulatory emotional self-efficacy. In this way, the traumatized adolescents can develop effective coping strategies when he/she confronts a traumatic event, so they present fewer PTSD symptoms and academic burnout (Ehlers & Clark, 2000; Xu et al., 2017).

Moreover, the current study has clinical implications. Given that dispositional mindfulness is potentially modifiable, it is a candidate for intervention with traumatized adolescents with PTSD and academic burnout. For example, training programs designed to increase dispositional mindfulness may help minimize PTSD symptoms and reduce academic burnout. In addition, our finding that the relationship between dispositional mindfulness, PTSD symptoms, and academic burnout was partially mediated by regulatory emotional self-efficacy, suggests that improving traumatized adolescents’
levels of regulatory emotional self-efficacy may be a productive way to minimize PTSD symptoms and reduce academic burnout.

**Limitations**

Several limitations of the current study should be noted. First, we failed to collect some demographic information such as socioeconomic status, which may be related to the development of academic burnout. Second, all of the measures used in the current study were dependent on self-reports. Follow-up studies should therefore consider the use of physiological assessments and ecological momentary assessments to support and validate current findings. Third, because this study was conducted 9 months after the Yancheng tornado, the participants may have experienced other traumatic events after the tornado. In addition, the government and charities provided a lot of support after the tornado occurred, and we should generalize the conclusions of the current study to other groups who may have experienced much more severe traumatic events with caution. Therefore, future studies with longitudinal designs are needed to examine the dynamic development of the relationships between dispositional mindfulness, regulatory emotional self-efficacy, PTSD symptoms, and academic burnout in adolescents who have experienced a natural disaster like a severe tornado.

**Declaration of interest**

The authors declare that they have no conflict of interest.

**Ethical standards and informed consent**

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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