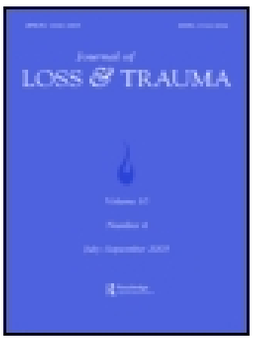

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Self-Acceptance, Post-Traumatic Stress Disorder, Post-Traumatic Growth, and the Role of Social Support in Chinese Rescue Workers

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ABSTRACT

Previous studies have suggested that the prevalence of mental health problems in rescue workers is relatively high. The current study investigates the relationship between Self-Acceptance, Post-Traumatic Stress Disorder (PTSD) and Post-Traumatic Growth (PTG) in Chinese rescue workers by examining the mediating role of social support. A sample of 297 Chinese medical rescue workers completed self-reported questionnaires, including the Self-Acceptance Questionnaire S-AQ), the Social Acknowledgement Questionnaire (SAQ), the Impact of Events Scale-Revised (IES-R) and the Posttraumatic Growth Inventory (PTGI). A structural equation model (SEM) approach was used. The results indicated that our model fitted the data adequately (χ^2/df = 2.150, RMSEA = 0.062, TLI = 0.978, CFI = 0.987) and suggested that social support partially mediated the relationship between self-acceptance, PTSD and PTG. The clinical implications and limitations of this research and recommendations for future research are discussed.

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Post-traumatic stress disorder; post-traumatic growth; self-acceptance; social support; rescue workers

Introduction

Natural disasters have a tremendous impact on psychological trauma among victims and rescue workers. As rescue workers are regularly confronted with potentially traumatizing on-duty events, they have an increased risk to develop trauma-related mental and physical health impairments, including post-traumatic, depressive, and somatic symptoms (Behnke, Conrad, Kolassa, & Rojas, 2019; Huang, Wang, Li, & An, 2019). Generally speaking, rescue workers include any persons who professionally or voluntarily engages in activities devoted to providing out-of-hospital acute medical care; transportation to definitive care; or providing assistance during accidents, fires, bombings, floods, earthquakes, other disasters and life-threatening conditions (Berger et al., 2012). Following a disaster, rescue

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workers are rushed from different areas to the disaster site for the first time and quickly participated in rescue work. During the rescue process, rescue workers undergo extreme pressure while providing first-aid and transport for injured victims and may experience psychological stress. This pressure, along with the scene of the tragedy, could have an adverse impact on the mental health of rescue workers (Ma, Meng, & Li, 2015; Witteveen et al., 2007). Fullerton, Ursano, and Wang (2004) found that rescue workers are strongly impacted by "indirect trauma", resulting in psychological problems such as anxiety, depression, and post-traumatic stress disorder (PTSD). Palgi, Ben-Ezra, Langer, and Essar (2009) investigated PTSD and depression status of rescue workers (including doctors, nurses, and managers) after the war between Lebanon and Israel and reported that the prevalence of PTSD among rescue workers was 24.53%. Similar findings have been reported elsewhere (Sperling, Levy, Garritano, & Chiang, 2003; Wang, 2005; Zhang, Wang, Huang, Wang, & Wang, 2013). In addition, a systematic review found that rescue workers, in general, have a current pooled PTSD prevalence that is much higher than that of the general population. Meta-regression modeling in studies carried out in the Asian continent had, on average, higher estimated prevalences than those from Europe (Berger et al., 2012). Given these initial findings, more research is needed to examine PTSD among rescue workers in China. The rescue workers in this study mainly focus on volunteers of the Red Cross Society in China.

On the other hand, researchers have also reported that individuals who experience traumatic events can also exhibit positive changes, which is known as posttraumatic growth (PTG; Tedeschi & Calhoun, 1996). PTG refers to positive psychological changes experienced by individuals after struggling with major life crises, including appreciation of life, relating to others, newfound possibilities in life, personal strength and spiritual change (Tedeschi & Calhoun, 1996). Baum and Ramon (2010) examined factors affecting the growth of social workers in Israel after the Second Intifada and reported that growth was mainly reflected in improvements of skills and knowledge, professional identity, and team cohesion. Another study of rescue workers from the Gansu earthquake in China indicated that rescue workers achieved PTG after performing rescue tasks (Zhang, Hu, Zang, & Wang, 2015). Consequently, the possibility of PTG should be acknowledged and further investigated despite the frequency of PTSD among rescue workers.

Current research has identified many factors found to influence PTSD and PTG, including the type of traumatic event, disaster exposure, and personality (Altindag, Ozen, & Sir, 2005; Breslau et al., 1998). However, most studies have mostly focused on risk factors rather than on protective factors, and few studies have examined potential protective factors. Identifying

protective factors of PTSD and promotive factors of PTG could provide potential intervention strategies for individuals adapting to functionality in life and occupations after trauma. Therefore, the current study examined positive coping style and social resource as protective factors, which are highly significant to individual adaptation from the perspective of positive psychology (Shallcross, Arbisi, Polusny, Kramer, & Erbes, 2016; Turner-Sack, Menna, & Setchell, 2012).

Self-compassion, a positive coping style, is a way of kindly and nonjudgmentally relating to oneself and one's emotional experiences (Neff, 2003). A component of self-compassion is self-acceptance, which is the tendency to be warm and understanding rather than judgmental or self-critical toward oneself (Seligowski, Miron, & Orcutt, 2015). It is a fundamental aspect of psychological health (Carson & Langer, 2006, Xu et al., 2017) and well-being (Zhang, 2017) and may buffer against the effects of adverse events. In addition, broadening and building on the theory of positive emotions has indicated that positive factors can help individuals expand their cognitive maps (Folkman & Moskowitz, 2000), enhance behavioral flexibility (Fredrickson, 2004), construct personal resources (Fredrickson, Tugade, Waugh, & Larkin, 2003), and eliminate the physiological effects of negative factors (Tugade & Fredrickson, 2004). Self-acceptance is also a fundamental, core characteristic of self-esteem (Wang, 2014). Furthermore, high levels of self-esteem can make traumatized people feel highly positive in the face of difficulties and setbacks (Carver & Scheier, 2001), which may lead them to focus more on positive changes after a trauma (Mystakidou et al., 2015). Therefore, self-acceptance might buffer against unfavorable outcomes and promote positive changes after stressful experiences. However, there is still a lack of empirical research on the relationship between self-acceptance and PTSD and PTG.

Furthermore, the potential mechanisms of the association between self-acceptance, PTSD, and PTG remain unclear. Studies have shown that the development of PTSD is related to physical, physiological, and psychosocial factors (Vernberg, La Greca, Silverman, & Prinstein, 1996). Social support helps people cope with traumatic experiences and is highly correlated with good mental health. People who report low levels of social support are found to have higher levels of stress, increased mental health morbidity in depression, PTSD, and increased mortality than people with high levels social support (Ahern et al., 2004). In addition, it has been shown that more social support can result in increased PTG (Yang, Lin, & Qian, 2010). According to the theory of social cognitive processing (Lepore & Greenberg, 2002), social support can provide a supportive environment for post-traumatic individuals, which helps them to think positively about traumatic events, integrate the meaning of such events, and thereby promote

PTG. As such, social support may enhance positive outcomes in the aftermath of disaster exposure, such as life satisfaction, self-efficacy and facilitating the integration of the meaning of traumatic events (An, Yuan, Wu, & Wang, 2018; Shallcross et al., 2016; Wang, Zhou, Wu, Zeng, & Tian, 2018). The Social Support Deterioration Deterrence (SSDD) model suggests that in the aftermath of disasters, people have unequal and inequitable access to and utilization of support, which may, in turn, influence people's different emotional outcome (Guilaran, de Terte, Kaniasty, & Stephens, 2018; Kaniasty & Norris, 2009). Nevertheless, research in this area are not always consistent. Some studies have found that providing support does not always result in positive psychological consequences. Therefore, the effect of social support on PTSD and PTG needs further study.

Despite this, few studies have explored the roles of social support in the association between self-acceptance and PTSD and PTG. Research on self-acceptance has demonstrated consistent associations with greater feelings of social support and social connectedness (Barnard & Curry, 2011; Neely, Schallert, Mohammed, Roberts, & Chen, 2009). Research shows that individuals can fully accept themselves so that they can correctly understand the strengths and weaknesses of others and accept each other. In other words, people with a high degree of self-acceptance can get along with others happily and have a good grasp of their relationship with others, so that they can get more social support in face of difficulties (Tarrant & Pelham, 2004). Beside, many investigated studies have also demonstrated that self-acceptance is positively associated with social support (Hang, 2016; Luan, Cao, Zhou, Yang, & Li, 2015; Ma & Wang, 2015). Therefore, this paper will investigate the mediating role of social support in the relationship between self-acceptance and PTSD and PTG.

As such, we aim to understand (1) the relationship between self-acceptance and PTSD and PTG, and (2) the potential mediating role of social support on the relationship between self-acceptance and PTSD–PTG.

Methods

Participants and procedure

Rescue workers from the Red Cross Society of China participated in the study ($N = 297$; 189 men (63.6%), 104 women (35.0%), 4 with no gender reported (1.3%); mean age = 20.7 years, age range 17.0–37.0 years). All rescue workers had direct contact with the victims of the disaster, and 59.7% had contact with the victims of the disaster more than once. The participants completed the self-reported questionnaires described below in a quiet room for approximately 30 minutes.

In this study, volunteers of JiangSu Province Red Cross relief center were selected as participants. These rescue workers have participated in many rescue missions, including the Wenchuan earthquake. They have provided victims with services such as rehabilitation, search and rescue, and medical treatment, and had direct contact with the victims. After obtaining written consent from the center and individuals, psychology graduate students from Nanjing Normal University issued questionnaires to the subjects, read out instructions, then completed the questionnaire collectively, all the graduate students had received questionnaire management training before. Participation in the study was voluntary. This study was approved by the Ethics Committee of the School of Psychology, in Nanjing Normal University.

Measures

Impact of event scale-revised (IES-R)

The Chinese version of the Impact of Events Scale-Revised (IES-R) was used to appraise DSM-IV-TR symptoms of PTSD among rescue workers. This scale includes 22 items and is used to assess the severity of PTSD including intrusive symptoms, avoidance symptoms and hypervigilance symptoms (Kelly et al., 1995). Each item is rated on a 5-point response scale from 0 (*not at all*) to 4 (*extremely*). Higher scores indicate higher level of symptoms. In the current sample, the scale had good internal consistency reliability, with a Cronbach's alpha of 0.88.

Posttraumatic growth inventory (PTGI)

PTG was assessed by using a modified version of the Posttraumatic Growth Inventory (PTGI; Zhou, Wu, An, Chen, & Long, 2014). This questionnaire includes 22 items that are divided into three dimensions with each assessed by a different subscale: changes of self-perceptions, changes of interpersonal experiences, and changes of life values. All items were scored on a 6-point scale that ranges from 0 (*no change*) to 5 (*very great degree of change)*. Higher scores indicate higher level of growth. In the current sample, the scale had good internal consistency reliability, with a Cronbach's alpha of 0.92.

The self-acceptance questionnaire (S-AQ)

Self-acceptance of the participants was assessed using Cong and Gao's (1999) Self-Acceptance Questionnaire. This scale comprises of two factors with a total of 16 items for assessing self-evaluation and self-acceptance. We choose "self-acceptance" part of whole questionnaire. Each item is rated

on a 4-point response scale from 1 (*highly opposite*) to 4 (*highly similar)*. Higher score indicating higher self-acceptance of the respondent. In the current sample, the scale had good internal consistency reliability, with a Cronbach's alpha of 0.78.

Social acknowledgement questionnaire (SAQ)

Social support was assessed using the Social Acknowledgement Questionnaire (Maercker & Müller, 2004). SAQ is designed to assess social support in individuals that have experienced trauma. There are 16 items in the original version of the questionnaire, with each item is rated on a 5-point response scale from 0 (*not at all*) to 4 (*very much*). Higher scores indicate higher perceived social support. In the current sample, the scale had good internal consistency reliability, with a Cronbach's alpha of 0.76.

Statistical analysis

The analyses were conducted using SPSS 22.0 and AMOS 21.0. Descriptive statistics were used to calculate the mean levels of the main measures, and Pearson's correlations were used to assess the relationships between self-acceptance, social support, PTSD and PTG. Structural equation modeling was conducted using the maximum likelihood estimation method. In the mediation model, social support was proposed to mediate the relationship between self-acceptance and PTSD/PTG. Bootstrapping was applied using 2000 bootstrap samples to test the statistical significance of the hypothesized mediational effect by AMOS. The indices that assessed the goodness-of-fit of the model included the ratio of χ^2 to the degree of freedom, Tucker-Lewis index (TLI), Comparative Fix Index (CFI) and root mean square error of approximation (RMSEA). For an index to be acceptable, the ratio of χ^2 to the degree of freedom should not exceed 3, GFI should exceed 0.9, CFI should exceed 0.95, and RMSEA should be smaller than 0.08 (Hu & Bentler, 1999).

Results

Sample characteristics

The values of the Pearson's correlations among all variables included in the model are reported in Table 1. Means and standard deviations are also presented. Self-acceptance is negatively associated with PTSD and positively associated with PTG and social support. Moreover, social support is positively correlated with PTG and negatively correlated with PTSD.

Table 1. Means and standard deviation of all variables, and correlations between variables.

	M	*SD*	1	2	3	4
1. PTSD	27.10	16.23	1			
2. PTG	64.01	18.70	−0.057	1		
3. Self-acceptance	42.09	5.52	−0.264**	0.188**	1	
4. Social support	21.72	4.50	−0.380**	0.227**	0.236**	1

**$p < .01$.

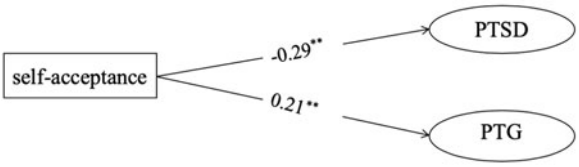

Figure 1. Direct effects ($N = 297$) with standardized beta weights and significance levels. **$p < 0.01$.

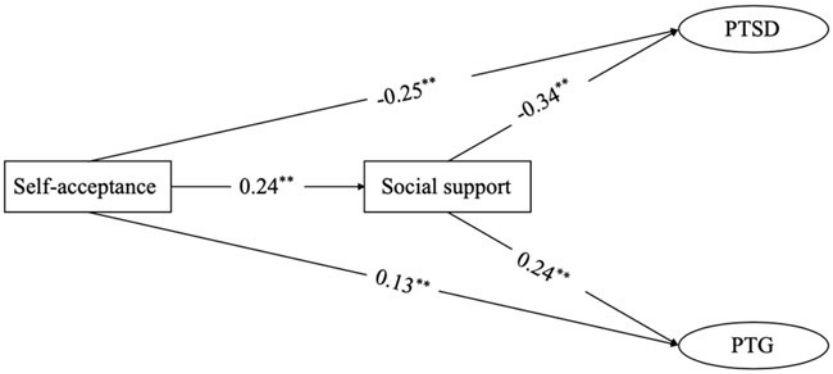

Figure 2. Mediational model ($N = 297$) with standardized beta weights and significance levels. **$p < 0.01$.

Direct effect of the association between self-acceptance and PTSD/PTG

As shown in Figure 1, the direct effects of the association between self-acceptance and PTSD and PTG indicated that the structural model had a good fit to the data (χ^2/df = 1.745, RMSEA = 0.050, CFI = 0.993, ILI = 0.993, TLI = 0.989). In addition, self-acceptance significantly predicted PTSD ($\beta = -0.467$, $p < .001$, 95% CI = −0.606 to −0.319) and PTG ($\beta = 0.404$, $p < .001$, 95% CI =0.103–0.664).

Mediating effect of social support on the association between self-acceptance and PTSD/PTG

As shown in Figure 2, the mediation model indicated a good fit to the data (χ^2/df = 2.061, RMSEA = 0.060, TLI = 0.980, CFI = 0.988, ILI= 0.988). The standardized direct and indirect effects are reported in Table 2. Table 2 shows that social support significantly mediated the relationship

Table 2. Standardized direct effects and indirect effects of PTSD and PTG.

Variable	Direct Effect			Indirect Effect		
	β	95% CI	p	β	95% CI	p
PTSD						
Self-acceptance	−0.350007	−0.500 to − 0.202	***	−0.117	−0.191 to −0.060	***
Social support	−0.38993	−0.508 to − 0.259	***	0	0	***
PTG						
Self-acceptance	0.282	0.009 to 0.531	.007	0.122	0.046 to 0.237	.007
Social support	0.406	0.148 to 0.621	***	0	0	***
Social support						
Self-acceptance	0.299	0.146 to 0.454	***	0	0	***

*** $p < .001$

between self-acceptance and PTSD ($\beta = -0.117$, $p < .001$, 95% CI = −0.11 to −0.006). In addition, social support significantly mediated the relationship between self-acceptance and PTG ($\beta = 0.122$, $p < .01$, 95% CI = 0.046–0.237).

Discussion

This study examined the relationship between self-acceptance and PTSD and PTG, as well as social support as mediator of this association among a sample of individuals with diverse forms of rescue experience. We had two main findings. First, we found that in this sample of 297 Chinese rescue workers, self-acceptance was negatively associated with PTSD and positively associated with PTG. Second, we found that, the influences of self-acceptance on PTSD and PTG were partially mediated by social support.

The finding that self-acceptance is negatively associated with PTSD and positively associated with PTG is consistent with prior research (Salami, 2010; Tang, 2011). On one hand, according to the broaden and build theory of positive emotions (Folkman & Moskowitz, 2000), people with a high degree of self-acceptance show high behavioral flexibility and develop positive personal resources in the face of difficulties and setbacks, which can alleviate PTSD. On the other hand, increasing levels of self-acceptance may contribute to more growth and subjective well-being for trauma survivors and then promote PTG, supporting the Recovery Model of mental healthcare (Charney & Marx, 2012). People who accept themselves are more likely to adopt an accepting attitude towards negative emotions and face their circumstances openly, leading them to focus more on positive changes following trauma.

The hypothesized model also suggests that social support plays a crucial role in the relationship between self-acceptance and PTSD as well as PTG. We found that social support partially mediated the relationships between self-acceptance, PTSD, and PTG in traumatized Chinese rescue workers. Firstly, this finding suggests that self-acceptance has an indirect association with PTSD and PTG. This acceptance and kindness toward themselves and

their experiences may play an important role in maintaining willingness to experience distressing thoughts and emotions (Seligowski et al., 2015). Secondly, it is possible that people with a higher degree of self-acceptance would be more relaxed and self-confident when interacting with others, leading them to be accepted by others. Furthermore from the Self-Acceptance Group Therapy perspective, people with higher acceptance may have a greater sense common humanity, which involves viewing one's suffering as part of the general human experience rather than viewing one's experiences as separate or isolated from the experiences of others (Schoenleber & Gratz, 2018). This would facilitate establishing better interpersonal relationships and increased social support when faced with difficulties and setbacks. Previous studies have reported that social support has a significant impact on PTSD of individuals with trauma (Ahmad et al., 2010). Lastly, this study found that a good social support system can provide individuals with material and spiritual support for coping with trauma and effectively alleviate psychological stress responses following trauma (Norris, Baker, Murphy, & Kaniasty, 2005). This is consistent with previous studies that social support positively predicted PTG (Nenova, DuHamel, Zemon, Rini, & Redd, 2013). According to Feeney and Collins's (2015) model which highlights two life contexts through which people may potentially thrive (coping successfully with life's adversities and actively pursuing life opportunities for growth and development) and the theory of social cognitive processing (Lepore & Greenberg, 2002), social support can provide a supportive environment to individuals in post-traumatic situations and help them think positively and integrate the meaning of the traumatic events and facilitate PTG.

Overall, this study is the first to show that rescue workers with a high degree of self-acceptance experience fewer PTSD symptoms and more PTG as a result of social support. However, social support might not be the only mediator in the relationship between self-acceptance, PTSD and PTG. Future research is required to identify other possible mediators, such as resilience, mindfulness, coping style and so on (Bhatnagar et al., 2013; Gao, Xiao, Zhang, Li, & Yan, 2018; Gil, 2005).

Several limitations of this study should be acknowledged. Firstly, the data were cross-sectional, and therefore, longitudinal research designs would allow us to examine the potentially causal effects of self character and social-psychological resources on mental health problems. Secondly, all the variables were assessed using self-report scales, which could have resulted in biased data. Therefore, future research data should be collected using different techniques including objective methods. Finally, trauma coping measures such as social support are dynamic and complex, containing multiple dimensions and changing in strength with the nature and context of

the trauma. Future research on these associations should consider more comprehensive and dynamic measures of self-acceptance and social support to capture these theoretical and substantive shortcomings. Despite these limitations, however, this study made a significant contribution to promoting the mental health of rescue workers by indicating that self-acceptance could be increased through appropriate psychological interventions. Interventions that help increase social support can improve the mental health of rescue workers. It is suggested that family and friends of rescue workers could provide them with more emotional and material support.

Disclosure statement

The author(s) declared no potential conflicts of interest with respect to this research, authorship, and/or the publication of this article.

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