Emotional intelligence, coping style, and social support as predictors of post-traumatic stress disorder

Jennifer Kelly
Derbyshire Healthcare NHS Foundation Trust, Derby.
United Kingdom.

Helen Scott
Department of Clinical Psychology, Staffordshire University, Stoke-on-Trent.
United Kingdom.

Hannah Bryan
South Staffordshire and Shropshire NHS Foundation Trust, Stafford.
United Kingdom.

Email H.Scott@staffs.ac.uk (Corresponding Author: Dr Helen Scott).

Abstract

Psychosocial factors operating during or after traumatic events are among the strongest predictors of post-traumatic stress disorder. Lower emotional intelligence has been linked to a range of mental health problems, but its role in psychological adaptation to trauma is unclear. This study evaluated trait emotional intelligence, coping style and social support as predictors of trauma symptomatology in 144 search and rescue volunteers. Emotional intelligence and social support were not associated with symptoms; the strongest predictor was maladaptive coping (R^2 = 0.35). Despite limitations, this study raises questions about the utility of the emotional intelligence construct in predicting post-traumatic stress disorder.

Key words: *Emotional intelligence, coping style, social support, trauma, post-traumatic stress disorder*

Introduction

A traumatic event has been defined as one where a person responds with intense fear, helplessness or horror to a situation involving the potential or actual death, serious injury or compromised physical integrity of the self or others (Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), American Psychiatric Association (APA), 2000). Research suggests that although most people will experience at least one traumatic event in their life, the psychological impact diminishes over time for the majority, with lifetime prevalence of post-traumatic stress disorder (PTSD) being less than 10%

(Kessler, Sonnega, Bromet, Hughes & Nelson, 1995). A diagnosis of PTSD requires that involuntary re-experiencing, hyperarousal, emotional numbing and avoidance are problematic more than a month after the event, causing clinically significant distress or impaired functioning (APA, 2000).

In addition to the types of situation which the general population may encounter (e.g. natural disasters, interpersonal violence, serious accidents or illness, bereavement), some people are also frequently exposed to traumatic events due to the nature of their work (e.g. military, emergency services, and search and rescue personnel). Whilst early intervention following a traumatic event is helpful for some individuals, others may be adversely affected by this and subsequently report increased PTSD symptoms (Roberts, Kitchiner, Kenardy & Bisson, 2010; 2012). It is therefore recommended that preventative interventions should only be offered where they can be carefully targeted at those most likely to experience difficulties. A greater understanding of the factors enabling some people to cope with trauma more adaptively than others is necessary to facilitate the identification of those for whom intervention may reduce the likelihood of developing PTSD.

Research suggests that although characteristics of the event and individual trauma and psychiatric history are also implicated, some of the strongest predictors of PTSD relate to psychosocial processes operating during and after the event (Brewin, Andrews & Valentine, 2000; Kangas, Henry & Bryant 2005; Lilly, Pole, Best, Metzler & Marmar, 2009). This includes a range of variables such as emotional responses and appraisal thereof, emotional regulation, and social support. Some of these factors appear to be closely linked to emotional intelligence (EI), a relatively new construct concerned with individual differences in the way emotions are identified, understood, used and regulated in the self and others (Salovey & Mayer, 1990).

A range of models of EI exist, which can broadly be categorised into those conceptualising it as an ability, and those regarding it as a trait (Cherniss, 2010). Ability EI is described as a set of cognitive abilities (e.g. the ability to perceive, express and regulate emotion), and is most appropriately assessed with maximal performance measures (e.g. Mayer & Salovey, 1997; Mayer, Salovey & Caruso, 2002). These have parallels with IQ measures of general intelligence, presenting respondents with a series of questions or problems to which there are objectively correct answers. Critics find this problematic, noting the difficulties inherent in determining what might be the 'correct' way to feel in any given situation, and questioning whether experiencing emotion differently from one's peers represents impaired ability (Cherniss, 2010). Performance measures are also frequently substituted with self-report questionnaires requiring respondents to assess their own abilities – thought to be particularly susceptible to inaccuracy where EI is low (e.g. Petrides, 2009).

Trait EI is conceptualised as self-perceived facets of personality relating to emotion and is typically measured by self-report (e.g. Petrides, 2011; Petrides, Pita, & Kokkinaki, 2007). Whilst it is acknowledged that this is an appropriate strategy to assess self-perceptions, it has been noted that like all self-reported information, responses are vulnerable to inaccuracy or misrepresentation (Daus,

2006). Although mixed models exist, including a range of abilities and personality features (e.g. Bar-On, 2006), the resulting construct covers such a broad range of factors that its utility has been questioned (Petrides, 2010). The majority of literature continues to treat ability and trait EI as two distinct concepts (Cherniss, 2010).

Whether conceptualised as an ability or a trait, a relationship between EI and reduced vulnerability to PTSD would be consistent with theoretical perspectives. These link the development and maintenance of difficulties to negative appraisals at the time of the event and subsequently, poor encoding and processing of memories, and avoidant coping responses (e.g. Brewin, Dalgleish & Joseph, 1996; Ehlers & Clark, 2000; Foa & Rothbaum, 1998). It is plausible that appraisals of emotional and physiological responses during the event could be influenced by how well these are identified and understood, affecting the degree of arousal and remaining resources available to encode and process memories.

Coping responses are often defined as the thoughts and behaviours an individual employs to try and manage situations that are perceived as stressful and are believed to be determined, in part, by perceptions of one's own capacity to understand and regulate distress, features of emotional intelligence (Folkman & Moskowitz, 2000; Lazarus & Folkman, 1984). There is evidence to support theoretical links between avoidant or maladaptive coping styles – thought to contribute to the maintenance of PTSD by preventing cognitive change – and lower EI (Gohm, Corser & Dalsky, 2005; Hunt & Evans, 2004; Matthews et al., 2006). This suggests a theoretical link between lower EI and avoidant or maladaptive coping styles.

Theory and research also suggest that lack of social support (being able to draw on social relationships to help cope with and manage situations) is associated with PTSD (Brewin et al., 2000; Ozer et al., 2003). It is thought that positive social interactions facilitate the cognitive and emotional processing required for successful adjustment, and support the development of more positive appraisals of the traumatic event and its consequences (e.g. Robinaugh et al., 2011). Several studies have found a positive relationship between EI and social support (Kwako, Szanton, Saligan & Gill, 2011; Lopes, Salovey, Cote & Beers, 2005; Smith et al., 2012), suggesting yet another mechanism by which EI might influence the psychological impact of trauma. For example, people with higher EI might be more likely to access social support for trauma, thus facilitating emotional processing and adjustment.

Evidence indicates that lower EI, particularly when conceptualised as a trait, is associated with a range of mental health problems (Martins, Ramalho & Morin, 2010; Schutte, Malouff, Thorsteinsson, Bhullar & Rooke, 2007). Taken together with the theoretical links outlined above, it appears that EI may be implicated in coping with trauma. Research focusing on this is nevertheless sparse to date, with only nine published studies empirically exploring the relationship (Smith et al., 2012). Although associations between higher EI and reduced psychological distress following trauma exposure were

consistently reported, caution should be exercised in making assumptions based on these studies given they were not always directly comparable. For example, exposure to traumatic events in one's occupational role (Wagner & Martin, 2012) is not the same as the trauma of living with breast cancer (Schmidt & Andrykowski, 2004). The evidence base is also limited by the extent to which potentially confounding factors of coping style and social support are considered. Theory and research suggest a number of mechanisms whereby EI might influence psychological adaptation to trauma. What remains unclear is whether these mechanisms, for example, the connections between EI and coping style or social support, fully account for its association with reduced post-traumatic distress. EI is related to differences in the strategies people employ to cope with stressors (e.g. Folkman & Moskowitz, 2000; Matthews et al., 2006), and differences in coping style may influence the psychological impact of trauma (e.g. Bryant & Harvey, 1995). It is therefore possible that any link between EI and more adaptive adjustment to trauma could be explained, at least in part, by its connection with coping style. Only one study has investigated relationships between EI, coping styles and PTSD symptoms (Hunt & Evans, 2004), finding that lower EI was related to avoidant coping, and only accounted for a small proportion of symptom variance.

Given that theoretical perspectives on coping with every-day and traumatic stressors are quite distinct, it is important to consider the types of trauma investigated. Research considering traumatic life events necessarily combines the effects of a broad range of experiences, and it is not always clear whether these would all fall within the definition of a traumatic event provided in diagnostic criteria (e.g. Hunt & Evans, 2004). For example, research findings based on clearly defined experiences (e.g. breast cancer, Schmidt & Andrykowski, 2004; occupational experiences of firefighters, Wagner & Martin, 2012) are more obviously relevant to identifiable populations.

It is known that some groups of people (e.g. emergency services, search and rescue personnel) are more frequently exposed to traumatic events than the general population, and may be at increased risk of developing PTSD (e.g. Fullerton, Ursano & Wang, 2004; North et al., 2002, Perrin et al., 2007). Expanding the evidence base concerning the role of EI in coping with trauma within these groups could be particularly helpful in increasing the applicability of findings to populations for whom the impact of trauma is potentially more problematic. This could arguably maximise clinical relevance in working towards the development of methods to identify and support those most likely to benefit from interventions.

The present study aims to address these limitations by investigating the relationship between trait EI, coping style and social support in search and rescue workers. The following specific research questions will be addressed:

1. Does trait EI predict PTSD symptomatology?
2. If so, does trait EI predict PTSD symptomatology independently of coping style and social support?

Method

Participants and Procedure

Participants were recruited from within Mountain Rescue England and Wales, a national charity whose volunteers search for and recover missing and injured people, often under difficult and dangerous circumstances. A sample of 144 Mountain Rescue volunteers was recruited through the organisation's email distribution lists: 124 were men (86%), and 20 were women (14%). As the majority of Mountain Rescue volunteers are men, this gender balance was representative. All Mountain Rescue volunteers are aged 18 or above with no upper age limit; the mean age was 47.24 (*SD* = 9.90, range 22-73). All 144 participants completed the questionnaires.

Ethical approval for the study was granted by Staffordshire University's Ethics and Peer Review Panel. Participants were recruited via an email containing a link to an internet-based survey (held online at www.qualtrics.com). Participants were asked to provide demographic data, and then presented with information about the nature of a traumatic event before being asked how many they had experienced. They were then asked to think about the most traumatic event they had encountered within their Mountain Rescue role, and information was collected about how long ago it occurred and how distressing they found it at the time (using the SUDS). Participants were not required to state what the most traumatic event was. Participants then completed the IES-R, Brief Cope, ISEL and TEIQue-SF questionnaires before being presented with debriefing information. All responses were anonymous.

Research suggests that events experienced as more distressing at the time are likely to have a greater impact (Ozer et al., 2003), but that symptoms often decline over time (Kessler et al., 1995). It is also possible that repeated exposure to trauma can have a cumulative psychological impact (Breslau, Chilcoat, Kessler & Davis, 1999). Therefore, information was also collected about potential confounds: distress severity, time since event, and lifetime number of traumatic events experienced.

Measures

Trait Emotional Intelligence Questionnaire – Short Form (TEIQue-SF; Petrides & Furnham, 2006)

EI was measured with the TEIQue-SF, a self-report questionnaire with 30 items; responses are rated on a 7-point Likert scale from 1 (Completely Disagree) to 7 (Completely Agree). The TEIQue-SF is designed to give a global score of trait EI, and was derived from the full form TEIQue (Petrides, 2009). Evidence suggests that the TEIQue-SF has construct and incremental validity (e.g. Cooper & Petrides, 2010; Mikoljczak et al., 2006; 2007) and in the present study demonstrated good reliability (Cronbach's alpha = 89.4).

Brief Cope (Carver, 1997)

Coping style was assessed with the Brief Cope, a 28 item self-report scale with 14 subscales developed from the full length COPE Inventory (Carver, Scheier, & Weintraub, 1989). This was designed to assess the strategies people typically employ to cope with a specified type of stressor, in this case managing the challenges of working as a Mountain Rescue volunteer. Responses are rated on a 4-point Likert scale from 1 ("I haven't been doing this at all") to 4 ("I've been doing this a lot"). The subscales can be combined to give totals for adaptive coping (e.g. positive reframing, acceptance, emotional support) and maladaptive coping (e.g. denial, substance misuse, and self-blame) (Carver, 1997). Evidence supports the validity of adaptive and maladaptive classifications (e.g. Meyer, 2001; Moore, Biegel & McMahon, 2011), with adequate reliability in the present study (Cronbach's alpha = 78.4 and 86.4 respectively).

Interpersonal Support Evaluation List (ISEL; Cohen, Memelstein, Kamarck & Hoberman, 1985)

The ISEL is a 40 item self-report measure of perceived social support, requiring responses to questions such as "There are several people that I trust to help solve my problems" on a 4-point Likert scale from 0 (Definitely False) to 3 (Definitely True). The questionnaire yields a total score and also has 4 subscales: appraisal (perceived availability of someone to talk about problems with), tangible (perceived availability of material assistance), self-esteem (perceived availability of positive comparison to others), and belonging (perceived availability of people to do things with). Reliability is demonstrated by Cronbach's alpha of 94.1 in the present sample, and research offers evidence of construct validity (e.g. Wills & Shinar, 1996).

Impact of Event Scale – Revised (IES-R; Weiss & Marmar, 1995)

PTSD symptomatology was assessed with the IES-R, a 22 item self-report scale giving a total score and having 3 subscales of intrusion, avoidance and hyperarousal. This is a development of the original IES (Horowitz, Wilner & Alvarez, 1979) with additional items relating to hyperarousal. Construct validity has been demonstrated (e.g. Creamer, Bell & Failla, 2003), and the measure is reliable in the present sample (Cronbach's alpha = 89.9). The IES-R is not intended for use as a diagnostic instrument and no clinical cut off scores are recommended, although research suggests that thresholds ranging from 22 to 33 may identify clinically significant levels of distress (e.g. Creamer et al., 2003).

Subjective Units of Distress Scale (SUDS; Wolpe, 1990)

Distress at the time of the traumatic event was assessed with the SUDS, a single item self-report scale on which an individual indicates a number from 0 (No Disturbance) to 10 (Highest Disturbance). As this was rated retrospectively, often many years after the event, the accuracy of responses may not be wholly reliable and the estimated and subjective nature of the measure is acknowledged.

Results

Descriptive statistics and correlations between variables of interest are shown in Table 1. Participants reported varied trauma experience with respect to time since most distressing event, subjective distress at the time and lifetime number of events experienced. EI was strongly positively related to social support and weakly but significantly negatively correlated with maladaptive coping, meaning that people with higher EI had more social support and engaged in less maladaptive coping strategies.

Table 1 Descriptive statistics and Pearson correlations between criterion variable (IES-R scores) and independent variables (time since event, SUDS, number of events, coping styles, perceived social support, and EI)

	IES-R	TSE	SUDS	No. events	Ad Cope	Mal Cope	ISEL	TEIQue - SF
Mean (*SD*)	7.01 (8.57)	76.77 (87.82)	5.24 (2.57)	21.72 (34.46)	24.71 (7.24)	14.04 (3.03)	89.89 (16.92)	155.07 (22.99)
IES-R	1							
TSE	-0.11	1						
SUDS	0.33*	0.16*	1					
No. events	0.09	0.12	0.03	1				
Ad Cope	0.58*	0.01	0.21*	0.16*	1			
Mal Cope	0.59*	-0.04	0.18*	0.30*	0.63*	1		
ISEL	0.03	0.06	0.14*	0.15*	0.02	-0.05	1	
TEIQue-SF	-0.11	0.11	0.13	0.16*	-0.02	-0.14*	0.69*	1

* $p < 0.05$

Note: IES-R, Impact of Event Scale – Revised (Weiss & Marmar, 1995); TSE, Time since event (in months); SUDS, Subjective Units of Distress Scale (Wolpe, 1990); Ad Cope, Adaptive coping scales of Brief Cope, (Carver, 1997); Mal Cope, Maladaptive coping scales of Brief Cope, (Carver, 1997);

ISEL, Interpersonal Support Evaluation List (Cohen, Memelstein, Kamarck & Hoberman, 1985); TEIQue-SF, Trait Emotional Intelligence Questionnaire-Short Form (Petrides & Furnham, 2006).

Regression analyses

To investigate the relationship between EI, coping style and social support (along with the potentially confounding variables of time since event, number of events, and subjectively rated distress (SUDS)) in predicting trauma symptomatology, initial standard multiple regression analysis was carried out. All potential predictors were included at this stage (see Table 2). The model was significant ($F(7,133) = 18.64$, $p < 0.001$), explaining 50% of the variance in IES-R scores (R^2), 47% when adjusted. Coping styles and SUDS were significant predictors of trauma symptomatology, but time since event, number of events, social support and EI were not. Gender and age were not selected as variables in the initial study proposal as it was anticipated that the sample would predominantly be male and were the main focus of interest, and age has often not been found to be a predictor of PTSD. However, to control for these variables they were entered into a preliminary regression but were not significant (gender, p=.119 and age p=.110) and thus were not included in the subsequent regression analyses.

Table 2 Summary of initial standard multiple regression analysis: Unstandardised and standardised coefficients of time since event, SUDS, number of events, coping styles, perceived social support and EI as predictors of trauma symptomatology (IES-R scores).

	B	***SE B***	β
Constant	-16.46	4.86	
Time since Event	-0.01	0.01	-.12
SUDS	0.73	0.22	.22*
Number of Events	-0.02	0.02	-.06
Adaptive Coping	0.37	0.10	.32*
Maladaptive Coping	1.01	0.24	.36*
Social Support	0.07	0.04	.13
Emotional Intelligence	-0.06	0.03	-.15

* $p < .05$

Note: $R^2 = .50$; Adjusted $R^2 = .47$

In order to maximise precision of the model, all non-significant predictors of psychological impact were removed except time since event, which was approaching significance ($p = 0.06$). Hierarchical regression was then employed (see Table 3) to explore the predictive power of coping styles, SUDS and time since event in predicting PTSD symptoms. Based on the previous analysis, variables were entered in order of their hypothesised predictive power. The full model was significant ($F(4,136) = 31.24$, $p < 0.001$), explaining 48% of the variance in IES-R scores (R^2), 46.4% when adjusted, with all

variables being significant predictors, though maladaptive and adaptive coping were the strongest predictors, with maladaptive coping demonstrating the highest scores on the IES-R.

Table 3 Summary of hierarchical multiple regression analysis: Unstandardised and standardised coefficients of coping styles, SUDS, and time since event as predictors of trauma symptomatology (IES-R scores)

	B	***SE B***	***β***
Step 1			
Constant	-16.58	2.77	
Maladaptive Coping	1.68	0.19	.59***
Step 2			
Constant	-18.07	2.65	
Maladaptive Coping	1.07	0.24	.38***
Adaptive Coping	0.41	0.10	.34***
Step 3			
Constant	-19.06	2.65	
Maladaptive Coping	1.00	0.23	.35***
Adaptive Coping	0.37	0.10	.31***
SUDS	0.73	0.22	.22**
Time since Event	-0.01	0.01	-.14*

*$p < .05$, ** $p < .01$, *** $p < .001$

Note: Step 1 $R^2 = .35$; Step 2 $\Delta R^2 = .07$ ($p < .001$); Step 3 $\Delta R^2 = .06$ ($p < .01$)

Further hierarchical multiple regression analysis was undertaken in order to fully address the specific research questions (of whether trait EI predicts PTSD symptomatology, and if so whether it does so independently of coping style and social support). A fourth step was added to the above model, in which social support and emotional intelligence were entered together. The addition to the model was not significant ($R^2 = 0.01$; change in F (2,134) = 1.75, $p = 0.18$), confirming that these variables did not explain any significant additional variance and EI did not predict PTSD symptomatology in this sample. As EI was not a significant predictor, the second research question became redundant and was not investigated.

Discussion

The findings showed that coping styles were the biggest predictor of PTSD symptoms, followed by distress at the time of the event, and time since event. Whilst adaptive and maladaptive coping styles were both significant predictors, maladaptive coping predicted higher scores on the trauma symptom measure. Trait EI and social support did not predict trauma symptoms. These findings are partly consistent with theory and research linking successful adaptation to trauma with individual differences

in coping style (e.g. Bryant & Harvey, 1995; Ehlers & Clark, 2000). It is unclear why adaptive coping was also a predictor of PTSD symptoms, though the overall reported trauma symptomology was low. Perhaps where trauma symptoms are low, coping styles are more variable and include a range of both adaptive and maladaptive styles, and are more problematic where there is greater reliance on maladaptive strategies. Given trauma symptoms were low in this sample, it might also suggest that factors other than coping style were influential, which is supported in the finding that the combined significant predictors accounted for less than 50% of the variance. In this sample, the lifetime number of traumatic events experienced was not related to PTSD symptoms, suggesting no cumulative effect of trauma. Event characteristics (retrospectively rated subjective distress and time since most traumatic event) accounted for only a small proportion of the variance in symptoms, supporting suggestions that psychosocial factors may be the strongest predictors of PTSD symptoms (e.g. Brewin et al., 2000).

This is the first known study investigating trait EI and PTSD symptomatology together, and it is interesting that no relationship was identified. EI within the sample was consistent with population norms (Cooper & Petrides, 2010), but relatively low levels of trauma-related symptoms were reported. It therefore remains plausible that trait EI could have greater influence where PTSD symptoms are more extreme.

The finding that lower perceived social support did not predict psychological distress in this sample is not consistent with the majority of published literature (e.g. Ozer et al., 2003). It is noteworthy that Mountain Rescue volunteers operate in teams and meet regularly for training events, and perceived social support may therefore be less variable in this population than in more diverse samples. There may also be some significance in the shared nature of trauma experiences and their organisational sequelae (e.g. formal team debriefing sessions, and/or informal subsequent discussion among team members), which might compensate for variances in other sources of social support. This may suggest that this way of working is helpful in potentially mitigating the psychological impact of trauma.

It is also unclear whether social factors would be more influential where levels of psychological distress are greater. Although the IES-R is not a diagnostic tool, employing a cut off score of 33 would suggest that 2.8% of this sample experienced clinically significant trauma-related symptoms. In light of evidence suggesting that after a traumatic event 8.1% of men and 20.4% of women go on to develop PTSD (Kessler et al., 1995), this figure is lower than might be expected. Although the majority of research finds elevated PTSD prevalence in emergency services and search and rescue personnel, this is not always the case (Del Ben et al., 2006; Javidi & Yadollahie, 2012). This may be due, in part, to self-selection of resilient individuals and early attrition of recruits who find this type of trauma unmanageably distressing, which would be consistent with this study's finding that cumulative exposure was not associated with elevated PTSD symptoms. These effects might be particularly emphasised in organisations like Mountain Rescue where volunteers are unpaid and financial barriers to leaving are minimised, highlighting the importance of considering sample characteristics. It is also

noteworthy that in this study, participants reported considerably greater use of adaptive than maladaptive coping strategies. Given that maladaptive coping did explain, albeit minimally, the largest proportion of symptom variance, the general tendency to use more positive strategies may at least partially account for the low rates of trauma-related problems observed in this sample.

Event characteristics may also affect the degree to which EI and social support are implicated in enabling individuals to cope adaptively. Evidence suggests that there may be a relationship between how directly an event is experienced and PTSD symptoms (e.g. Hoge et al., 2004). Although incidents vary, Mountain Rescue volunteers are likely to be more indirectly involved in the majority of traumatic events, and have time to prepare mentally before arriving at the scene. Perhaps EI and social support are more relevant to coping with the potentially more severe psychological impact of unanticipated events or direct harm.

Findings of this study suggest that individual differences in coping style may be more relevant to psychological adaptation to trauma than EI or social support. Owing to the cross-sectional design causality cannot be inferred, but the importance of coping style is consistent with existing research (e.g. Bryant & Harvey, 1995). This may provide a useful starting point in developing psycho-education and training programmes to maximise the use of particular coping strategies, especially for groups of people who are more likely to experience traumatic situations (e.g. by virtue of their occupation).

Limitations

Research focusing on groups who experience frequent exposure to traumatic events may maximise clinical relevance, in that findings are more likely to be applicable to populations who are at increased risk of developing PTSD (e.g. Fullerton et al., 2004; Perrin et al., 2007). It would nevertheless have been helpful to include a comparison group to evaluate the effects of potentially population-specific factors such as levels of social support. In the absence of a comparison group it would anyway be difficult to determine the degree to which results might be relevant to the general population, or indeed to other groups frequently exposed to trauma (e.g. firefighters) with different team and support structures.

A further limitation of this research was the constrained range of PTSD symptomatology reported, meaning that the role of EI and social support are unclear where the psychological impact of trauma is more extreme; evidence from clinical samples may be needed to address this question. Although measures were completed anonymously, as with all self-report questionnaires, there is a possibility of socially desirable or inaccurate responses due to poor self-awareness or deliberate misrepresentation. Taken together, these factors may influence both the extent to which distress is recognised, and the openness with which it is reported. Finally, owing to consideration of the response burden on participants, a number of factors thought to predict PTSD were not investigated (e.g. childhood maltreatment and family psychiatric history, Brewin et al., 2000). Given this study found that EI, coping style, social support and event characteristics accounted for less than half the

variance in PTSD symptoms, future research including a wider range of variables may therefore generate models with greater explanatory power.

Despite its limitations, however, this study raises questions about the incremental utility of EI, over and above coping style and social support, in predicting PTSD symptomatology. In addition to controversies surrounding its definition and measurement, EI is a relatively broad construct which overlaps substantially with other measures of individual differences associated with adaptive functioning (e.g. Van Rooy & Viswesvaran, 2004).

Future Research

As characteristics of the sample limit the extent to which results can be generalised, further research is needed to determine whether EI is a useful construct in considering individual differences in psychological adaptation to trauma. An improved understanding of the factors affecting vulnerability to PTSD would offer greater insight into the development and maintenance of PTSD, and could therefore help to refine intervention strategies. It would also facilitate the identification of those most at risk in the aftermath of a traumatic event, which is particularly important in light of evidence suggesting that preventative interventions may actually exacerbate symptoms for some individuals (Roberts et al., 2010; 2012).

Conclusion

Neither trait EI nor social support were associated with trauma-related symptoms, the strongest predictor of which was a maladaptive coping style. Trait EI was correlated with social support and coping style, suggesting that conclusions drawn from regression models not considering all three factors may be unreliable. The finding that maladaptive coping was the strongest predictor of trauma symptoms may be useful in designing training programmes for groups of people who are, like Mountain Rescue volunteers, frequently exposed to traumatic situations. Research suggests that coping styles can become more adaptive in response to intervention (e.g. Steinhardt & Dolbier, 2008), and avoidant strategies have particular implications in the development and maintenance of PTSD (Ehlers & Clark, 2000). Interventions prioritising the development of adaptive coping, rather than general EI enhancement, may, therefore, offer the most effective strategy for minimising the psychological effects of trauma. Further research exploring these issues may be helpful in mitigating the impact of PTSD on individuals, families, services and society as a whole.

Acknowledgements

We would like to express our gratitude to all those Mountain Rescue England and Wales volunteers who gave up their time to take part in this study and for the help from the organisation as a whole.

About the authors

Dr Jen Kelly is a Clinical Psychologist in a Community Mental Health Team in Derby. She works with a range of adults with complex needs, many of whom have developed mental health difficulties as a consequence of experiencing a traumatic event.

Dr Helen Scott is a Clinical Psychologist and Senior Lecturer in Clinical Psychology on the Doctoral Programme in Clinical Psychology, which is run jointly by Staffordshire and Keele Universities. She has a background in research and her clinical background is in working with adults with mental health problems, including Emergency Service Personnel.

Dr Hannah Bryan is a Clinical Psychologist who undertakes clinical work in a Community Mental Health Team in Staffordshire. She has extensive experience of working with adults who have experienced trauma, and expertise in therapeutic approaches to working with trauma.

References

American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.). Washington DC: Author.

Bar-On, R. (2006). The Bar-On model of emotional-social intelligence (ESI). *Psicothema, 18* (Suppl), 13-25.

Bresslau, N., Chilcoat, H. D., Kessler, R. C., & Davis, G. C. (1999). Previous exposure to trauma and PTSD effects of subsequent trauma: Results from the Detroit area survey of trauma. *American Journal of Psychiatry, 156*(6), 902-907.

Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68(5),* 748-766.

Bryant, R. A., & Harvey, A. G. (1995). Avoidant coping style and post-traumatic stress following motor vehicle accidents. *Behaviour Research and Therapy, 33*(6), 631-635.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine, 4,* 92-100.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*, 267-283.

Cherniss, C. (2010). Emotional intelligence: Toward clarification of a concept. *Industrial and Organizational Psychology, 3,* 110-126.

Cohen, S., Memelstein, R., Kamarck, T., & Hoberman, H. (1985). Measuring the functional components of social support. In I. G. Sarason & B. Sarason (Eds.), *Social support: Theory, research and application* (pp. 73-94). The Hague: Martinus Nijhoff.

Cooper, A., & Petrides, K. V. (2010). A psychometric analysis of the trait emotional intelligence questionnaire-short form (TEIQue-SF) using item response theory. *Journal of Personality Assessment, 92,* 449-457.

Creamer, M., Bell, R., & Failla, S. (2003). Psychometric properties of the Impact of Event Scale – Revised. *Behaviour Research and Therapy, 41*(12), 1489-1496.

Del Ben, K., Scott, J., Chen, Y., & Fortson, B. (2006). Prevalence of posttraumatic stress disorder symptoms in firefighters. *Work & Stress, 20,* 37-48.

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy, 38,* 319-345.

Folkman, S., & Moskowitz, J.T. (2000). Positive affect and the other side of coping. *American Psychologist,* 647-654.

Fullerton, C. S., Ursano, R. J., & Wang, L. (2004). Acute stress disorder, posttraumatic stress disorder, and depression in disaster or rescue workers. *American Journal of Psychiatry, 161,* 1370-1376.

Gohm, C. L., Corser, G. C., & Dalsky, D. J. (2005). Emotional intelligence under stress: Useful, unnecessary, or irrelevant? *Journal of Personality and Individual Differences, 39,* 1017-1028.

Hoge, C. W., Castro, C. A., Messer, S. C., McGurk, D., Cotting, D. I., & Koffman, R. L. (2004). Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *New England Journal of Medicine, 351,* 13-22.

Horowitz, M. J., Wilner, N., & Alvarez, W. (1979). Impact of Event Scale: A measure of subjective stress. *Psychosomatic Medicine, 41,* 209-218.

Hunt, N., & Evans, D. (2004). Predicting traumatic stress using emotional intelligence. *Behaviour Research and Therapy, 42,* 791-798.

Javidi, H., & Yadollahie, M. (2012). Post-traumatic stress disorder. *The International Journal of Occupational and Environmental Medicine, 3*(1), 2-9.

Kangas, M., Henry, J. L., & Bryant, R. A. (2005). Predictors of posttraumatic stress disorder following cancer. *Health Psychology, 24*(6), 579-585.

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry, 52*(12), 1048–1060.

Kwako, L. E., Szanton, S. J., Saligan, L. N., & Gill, J. M. (2011). Major depressive disorder in persons exposed to trauma: Relationship between emotional intelligence and social support. *Journal of the American Psychiatric Nurses Association, 17*(3), 237-245.

Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal, and Coping*. New York: Springer.

Lilly, M. M., Pole, N., Best, S. R., Metzler, T., & Marmar, C. R. (2009). Gender and PTSD: What can we learn from female police officers? *Journal of Anxiety Disorders, 23,* 767-774.

Lopes, P. N., Salovey, P., Cote, S., & Beers, M. (2005). Emotion regulation abilities and the quality of social interaction. *Emotion, 5,* 113-118.

Martins, A., Ramalho N., & Morin, E. (2010). A comprehensive meta-analysis of the relationship between emotional intelligence and health. *Personality and Individual Differences, 49,* 554-564.

Matthews, G., Emo, A. K., Funke, G., Zeidner, M., Roberts, R. D., Costa, P. T., Jr., & Schulze, R. (2006). Emotional intelligence, personality, and task-induced stress. *Journal of Experimental Psychology: Applied, 12*(2), 96-107.

Mayer, J. D., & Salovey, P. (1997). What is emotional intelligence? In P. Salovey & D. Slouyter (Eds.), *Emotional development and emotional intelligence: Educational applications* (pp. 3-31). New York, USA: Basic Books.

Mayer, J. D., Salovey, P., & Caruso, D. R. (2002). *Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT): User's manual.* Ontario, Canada: Multi-Health Systems, Inc.

Meyer, B. (2001). Coping with severe mental illness: Relations of the Brief Cope with symptoms, functioning and well-being. *Journal of Psychopathology and Behavioural Assessment, 23*(4), 265-277.

Mikolajczak, M., Luminet, O., & Menil, C. (2006). Predicting resistance to stress: Incremental validity of trait emotional intelligence over alexithymia and optimism. *Psicothema, 18,* 79-88.

Mikolajczak, M., Luminet, O., Leroy, C., & Roy, E. (2007). Psychometric properties of the trait emotional intelligence questionnaire: Factor structure, reliability, construct, and incremental validity in a French-speaking population. *Journal of Personality Assessment, 88*(3), 338-353.

Moore, B. C., Biegel, T. E., & McMahon, T. J. (2011). Maladaptive coping as a mediator of family stress. *Journal of Social Work Practice in the Addictions, 11*(1), 17-39.

North, C. S., Tivis, L., McMillen, J. C., Pfefferbaum, B., Spitznagel, E. L., Cox, J., Nixon, S., Bunch, K. P., & Smith, E. M. (2002). Psychiatric disorders in rescue workers after the Oklahoma City bombing. *American Journal of Psychiatry, 159,* 857-859.

Ozer, E. J., Best, S. R., Lipsey, T. L., & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin, 129*(1), 52-73.

Perrin, M. A., DiGrande, L., Wheeler, K., Thorpe, L., Farfell, M., & Brackbill, R. (2007). Difference in PTSD prevalence and associated risk factors among World Trade Centre disaster rescue and recovery workers. *American Journal of Psychiatry,164,* 1385-1394.

Petrides, K. V. (2009). Psychometric properties of the trait emotional intelligence questionnaire (TEIQue). In C. Stough, D. H. Saklofske, & J. A. Parker (Eds.), *Assessing emotional intelligence: Theory, research, and applications* (pp. 85-101). New York: Springer Science + Business Media.

Petrides, K. V. (2011). Ability and trait emotional intelligence. In T. Chamorro-Premuzic, A. Furnham, & S. Von Stumm (Eds.), *The Blackwell-Wiley Handbook of Individual Differences* (pp. 656-678). New York: Wiley.

Petrides, K. V. & Furnham, A. (2006). The role of trait emotional intelligence in a gender-specific model of organizational variables. *Journal of Applied Social Psychology, 36*, 552-569.

Petrides, K. V., Pita, R., & Kokkinaki, F. (2007). The location of trait emotional intelligence in personality factor space. *British Journal of Psychology, 98,* 273–289.

Ramos, N. S., Fernandez-Berrocal, P., & Extremera, N. (2007). Perceived emotional intelligence facilitates cognitive-emotional processes of adaptation to an acute stressor. *Cognition and Emotion, 21*(4), 758-772.

Roberts, N. P., Kitchiner, N. J., Kenardy, J., & Bisson, J. I. (2010). Multiple session early psychological interventions for the prevention of post-traumatic stress disorder. *Cochrane Database of Systematic Reviews,* (3), CD006869.

Roberts, N. P., Kitchiner, N. J., Kenardy, J., & Bisson, J. I. (2012). Early psychological interventions to treat acute traumatic stress symptoms. *Cochrane Database of Systematic Reviews,* (3), CD007944.

Robinaugh, D. J., Marques, L., Traeger, L. N., Marks, E. H., Sung, S. C., Beck, J. G., Pollack, M. H., & Simon, N. M. (2011). Understanding the relationship of perceived social support to post-trauma cognitions and posttraumatic stress disorder. *Journal of Anxiety Disorders, 25,* 1072-1078.

Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, Cognition, and Personality, 9,* 185–211.

Salovey, P., Mayer, J. D., Goldman, S. L., Turvey, C., & Palfai, T. P. (1995). Emotional attention, clarity, and repair: Exploring emotional intelligence using the trait meta-mood scale. In J. Pennebaker (Ed.), *Emotion, disclosure, and health* (pp. 125-154). Washington, DC: American Psychological Association.

Schmidt, J. E., & Andrykowski, M. A. (2004). The role of social and dispositional variables associated with emotional processing in adjustment to breast cancer: an Internet-based study. *Health Psychology, 23*(3), 259–266.

Schutte, N. S., Malouff, J. M., Thorsteinsson, E. B., Bhullar, N., & Rooke, S. E. (2007). A meta-analytic investigation of the relationship between emotional intelligence and health. *Personality and Individual Differences, 42*(6), 921–933.

Smith, S. G., Turner, B., Pati, J., Petrides, K. V., Sevdalis, N., & Green, J. S. A. (2012). Psychological impairment in patients urgently referred for prostate and bladder cancer investigations: The role of trait emotional intelligence and perceived social support. *Supportive Care in Cancer, 20,* 699-704.

Steinhardt, M., & Dolbier, C. (2008). Evaluation of a resilience intervention to enhance coping strategies and protective factors and decrease symptomatology. *Journal of American College Health, 56*(4), 445-453.

Van Rooy, D. L., & Viswesvaran, C. (2004). Emotional Intelligence: A meta-analytic investigation of predictive validity and nomological net. *Journal of Vocational Behavior, 65*(1), 71-95.

Wagner, S.L., & Martin, C. A. (2012). Can firefighter mental health be predicted by emotional intelligence and proactive coping. *Journal of Loss and Trauma,17*(1), 56-72.

Weiss, D. S., & Marmar, C. R. (1995). The Impact of Event Scale – revised. In J. P. Wilson & T. M. Kean (Eds.), *Assessing psychological trauma and PTSD: A practitioner's handbook* (pp. 399-411). New York: Guilford.

Wills, T. A., & Shinar, O. (1996). Measuring perceived and received social support. In S. Cohen, L. G. Underwood & B. H. Gottleib (Eds.), *Social Support Measurement and Intervention: A guide for health and social scientists* (pp. 86-135). USA: Oxford University Press.

Wolpe, J. (1990). *The Practice of Behavior Therapy* (4th ed.). New York: Pergamon.