

Does trauma risk management reduce psychological distress in deployed troops?

W. Frappell-Cooke¹, M. Gulina², K. Green³, J. Hacker Hughes¹ and N. Greenberg⁴

¹Defence Clinical Psychology Service, HQ Surgeon General, DMS Whittington, Lichfield, Staffordshire WS14 9PY, UK,

²Department of Psychology, City University, Northampton Square, London EC1V 0HB, UK, ³Navy Command Headquarters, MP 3-1, Leach Building, Whale Island, Portsmouth PO2 8BY, UK, ⁴Academic Centre for Defence Mental Health, London, UK.

Correspondence to: N. Greenberg, Academic Centre for Defence Mental Health, Academic Department of Psychological Medicine (IOP), Weston Education Centre, Cutcombe Road, London SE5 9RJ, UK. Tel: +44 (0)207 848 5351; fax: +44 (0)207 848 5397; e-mail: wfcpsych@talktalk.net

Background	Military personnel exposed to potentially traumatic events whilst deployed on operational duties may develop psychological problems. The Royal Marines have made extensive use of Trauma Risk Management (TRiM), a peer-support system that operates through practitioners embedded within operational units. TRiM aims to promote recognition of psychological illness and to facilitate social support.
Aims	To evaluate the effects of TRiM in two units at different stages of implementation.
Methods	Royal Marines and Army personnel were surveyed prior to, during and upon return from an operational deployment to Afghanistan. Participants completed measures of general mental health (GHQ12) and traumatic stress [PCL(C)].
Results	We received responses from 180 pre-deployment, 105 during deployment and 137 post-deployment. Personnel within units with experience of TRiM reported lower levels of psychological distress than personnel in the unit who were using TRiM for the first time. Both groups reported higher psychological distress scores before and during deployment, compared with post-deployment. However, we found personnel who reported having more access to social support during deployment reported less psychological distress.
Conclusions	The use of TRiM may assist in increasing the psychological resilience of military personnel through the facilitation of social support; this may have particular utility during operational deployments.
Key words	Armed forces; military; combat; post-traumatic stress disorder; social support.

Introduction

Military personnel, because of their vocation, risk frequent exposure to potentially traumatic events [1] which itself is linked to negative psychological health outcomes. US researchers report that 15–17% of US troops deployed to Iraq or Afghanistan suffered from either acute stress disorder or post-traumatic stress disorder (PTSD) [2], both conditions which may impair occupational effectiveness. Although UK research has found substantially lower PTSD prevalence rates of 4–7% [3,4] in troops who deployed to conflict zones, these figures suggest that a significant proportion of UK military personnel may be functioning less than optimally.

Although exposure to traumatic events increases the likelihood of developing PTSD, other factors, including prior history of psychiatric illness [5–7], and repeated traumatic exposures [7] also increase the risk. One of the most important, and modifiable, risk factors is social support [7]. The extensive literature concerning PTSD

risk factors [7,8] suggests that effective social support, including access to supportive family, friends and work colleagues, can lessen the risk of adverse post-trauma reactions. Other authors also report that social support acts as a buffer to developing PTSD [9,10].

Research conducted in both military [10] and non-military [11] populations working in high-threat locations has shown that personnel frequently favour informal sources of support over professional help. These findings are especially relevant during deployment where access to medical personnel may be limited. Also, there is a plethora of research which reports that many personnel who might benefit from interventions do not access help therefore increasing the use of trained peers may be more acceptable [12]. Stigma has been reported in US military personnel returning from Bosnia [13] and in UK military samples [14] and is likely to affect many personnel working for organizations in high-threat areas that require an especially resilient workforce.

Trauma Risk Management (TRiM) is a proactive peer-group model of psychological risk assessment used by the Royal Marines for over 10 years. It aims to promote recognition of psychological illness [15] and keep personnel functioning after traumatic events by enhancing the understanding and acceptance of stress reactions within an appropriate environment. TRiM practitioners provide basic psychoeducational briefings and provide appropriate feedback and support after traumatic events. Trauma risk assessment interviews completed after 72 h, and again after 1 month, assess how individuals are coping, in keeping with National Institute of Clinical Excellence guidelines on PTSD management [16]. To enhance exposure of the system, TRiM education is included in all new recruit training and promotion courses.

Field trials of TRiM appear successful [15] and a cluster randomized controlled trial conducted within the Royal Navy [17] over a 12- to 18-month period found no evidence that TRiM causes harm and some evidence that it is beneficial for organizational function.

This study aimed to investigate how TRiM works in the deployed environment by comparing the mental health of two units at different stages of TRiM usage prior to, during and after deployment. We hypothesized that (i) the TRiM-experienced unit would have a lower prevalence of psychological distress than the TRiM-naive unit and (ii) the TRiM-experienced unit would be more resistant to the development of combat-related stress than the TRiM-naive unit.

Methods

This study was a non-randomized parallel-group comparison trial that aimed to evaluate the effects of TRiM upon the level of post-trauma reactions within two groups of personnel: a company of army infantry [Coldstream Guards ($n = 86$)] in the initial stages of using TRiM and a company of Royal Marine Commandos ($n = 94$) which had already incorporated TRiM into their distinctive organizational culture. They were selected by reference to their experience of using TRiM and the timing of their next deployment. All participants were considered physically and emotionally fit for combat at the time of the study.

The questionnaires included questions concerning demographics, previous psychological problems, previous deployments and two measures of current psychological functioning: the General Health Questionnaire (GHQ12) [18] to measure symptoms of general psychological distress, scoring 0, 0, 1, 1, to indicate any change in functioning, whereby ≥ 4 indicated caseness; and the PTSD Checklist Civilian version [PCL(C)] [19] as a measure of symptoms of PTSD, where caseness was indicated by a score of ≥ 50 and an endorsement of moderate or above on one of the re-experiencing symptoms, three avoidance symptoms and two hyperarousal symptoms. Also included was the Combat Experiences Question-

naire [3] to identify experiences during deployment, summed to provide an overall measure of deployment stress and perceived support during deployment. Responses were grouped to assist in analysis.

Both groups were deployed to Afghanistan in September/October 2007 and experienced relatively similar combat conditions for approximately 6 months. Data were requested on three occasions: August/September 2007, approximately 4–6 weeks prior to deployment; December 2007/January 2008, approximately 3 months into combat, and April/May 2008 within the first week upon return from deployment. The research was authorized by the Ministry of Defence Research Ethics Committee and City University Ethics Committee.

Data were examined using parametric statistical tests where data were normally distributed and non-parametric equivalent tests for skewed or unequally distributed data. Sociodemographic characteristics of the groups were compared. Chi-square tests were used for categorical data and Mann–Whitney *U*-tests used for continuous data. Multiple logistic regression was used to determine odds ratios (OR) with 95% confidence intervals (CIs) for the outcome variables of the GHQ12 and PCL(C) controlling for potential confounders and Pearson's *r* to identify associations between variables.

Results

The initial sample sizes of 94 and 86 represented all available personnel in the units during initial data collection; no personnel declined to complete the questionnaires. At follow-up, during and post-deployment, some 56 and 91 Royal Marines and 49 and 46 Coldstream Guards responded, respectively. The samples differed significantly in terms of their education and deployment experiences but not with respect to rank and age (Table 1).

Chi-square analysis showed a significant difference on all combat experiences pre-deployment; the Coldstream Guards reported more combat experiences, other than for enemy experiences. However, the situation was reversed post-deployment since a higher number in the Royal Marines indicated more combat experiences, significantly so with aggressive acts and enemy experiences. The majority felt supported during their tour of duty (Table 2).

Table 3 shows pre-deployment cases of general distress ($\text{GHQ12} \geq 4$) to be higher in the Coldstream Guards. Both groups reported less general distress post-deployment than before or during deployment. Before and during deployment the Coldstream Guards indicated more cases of trauma-related stress [$\text{PCL(C)} \geq 50$]. Post-deployment, general distress was higher in the Coldstream Guards than the Royal Marines, although differences were not significant.

Ordinal logistical regression analysis was utilized for a comparison of pre- and post-deployment general and trauma-related stress. Before deployment, the Coldstream

Guards' prevalence of general distress was significantly higher ($P < 0.01$) compared with the Royal Marines. This difference remained even when controlling for previous deployments and was more marked (OR 4, CI 1.54–

Table 1. Demographic characteristics of the Royal Marines and Coldstream Guards

	Royal Marines, <i>n</i> (%)	Coldstream Guards, <i>n</i> (%)	<i>P</i> values
Age			
18–24 years	63 (67)	51 (59)	NS
25–29 years	20 (21)	24 (28)	
30–39 years	10 (11)	11 (13)	
40+ years	1 (1)		
Education			
No qualifications	13 (14)	21 (24)	$P < 0.001$ (chi square)
O levels	41 (43)	44 (51)	
A levels	25 (27)	9 (11)	
Degree/postgraduate	15 (16)	10 (12)	
Rank			
Junior	73 (78)	54 (63)	NS
Junior NCO	15 (16)	14 (16)	
Senior NCO	3 (3)	6 (7)	
Officer	2 (2)	7 (8)	
Deployment			
No deployments	70 (75)	33 (38)	$P < 0.001$ (Mann–Witney <i>U</i>)
≥1 deployments	24 (25)	53 (62)	
Mean	0.79	1.37	
Median	0	1	

NCO, non-commissioned officer.

Table 2. Combat experiences data of the Royal Marines and Coldstream Guards pre- and post-deployment

	Royal Marines, <i>n</i> (%)—pre-deployment	Royal Marines, <i>n</i> (%)—post-deployment	Coldstream Guards, <i>n</i> (%)—pre-deployment	Coldstream Guards, <i>n</i> (%)—post-deployment	<i>P</i> values (chi square)—pre-deployment	<i>P</i> values (chi square)—post-deployment
Committed aggressive act						
No	12 (13)	3 (3)	38 (44)	17 (37)	$P < 0.001$	$P < 0.001$
Yes	13 (14)	87 (96)	13 (15)	28 (61)		
Perceived self in danger						
No	1 (1)	0	7 (8)	0	$P < 0.001$	NS
Yes	24 (26)	90 (99)	44 (51)	46 (100)		
UK experience						
No	12 (13)	14 (15)	23 (27)	13 (28)	$P < 0.001$	NS
Yes	13 (14)	76 (84)	28 (33)	33 (72)		
Enemy experience						
No	8 (9)	25 (28)	38 (44)	23 (50)	$P < 0.001$	$P < 0.01$
Yes	17 (18)	65 (71)	13 (15)	23 (50)		
Work outside ability						
No	24 (26)	81 (89)	46 (54)	44 (96)	$P < 0.001$	NS
Yes	1 (1)	8 (9)	4 (5)	2 (4)		
Felt supported on tour of duty						
No	4 (4)	3 (3)	7 (8)	4 (9)	$P < 0.001$	NS
Yes	20 (21)	85 (93)	41 (48)	42 (91)		

'UK experience' and 'enemy experience' refer to subjects having witnessed or assisted with wounded or handling bodies of UK or enemy personnel, respectively. Total percentages may vary as data for subjects with no prior deployments and non-responders have not been included.

10.35) for those participants who had not previously deployed than in those who had (OR 1.5, CI 0.44–5.02). The Coldstream Guards indicated significantly higher trauma-related stress ($P < 0.001$) compared with the Royal Marines at pre-deployment, the difference greatest in participants who had previously deployed ($P < 0.01$, OR 6, CI 1.92–19.0) than in those not previously deployed ($P < 0.05$, OR 2.5, CI 1.05–5.90). Post-deployment, general stress was higher in the Coldstream Guards than the Royal Marines, although differences were not significant. Trauma-related stress levels were similar. Adjustment for confounders did not substantially affect the results.

Table 3 also describes perceptions of unit social support (the ability to talk and express problems with unit members) and Table 2 describes perceptions of a network of support during the tour. Although these questions refer to similar concepts, responses to the questions differed. During deployment, perceptions of social support from unit members increased slightly for the Royal Marines but reduced for the Coldstream Guards. At post-deployment, negative responses increased for both groups.

Comparing GHQ12 scores whilst deployed and whether participants perceived a support network during the tour showed that personnel in the Royal Marines ($r = -0.44$, $P < 0.001$) and Coldstream Guards ($r = -0.42$, $P < 0.01$) who were more generally distressed also perceived less of a support network during the tour. Similarly, comparison of the GHQ12 and perception of social support from unit members showed that those who were suffering more general distress (Royal Marines $r = -0.36$, $P < 0.01$, Coldstream Guards $r = -0.42$,

Table 3. Psychological distress and positive perceptions of unit social support for the Royal Marines and Coldstream Guards

	Royal Marines, <i>n</i> (%), median— pre-deployment	Royal Marines, <i>n</i> (%), median— during deployment	Royal Marines, <i>n</i> (%), median— post-deployment	Coldstream Guards, <i>n</i> (%), median—pre- deployment	Coldstream Guards, <i>n</i> (%), median—during deployment	Coldstream Guards, <i>n</i> (%), median—post- deployment
GHQ12 \geq 4	7 (8) [0]	12 (22) [0]	3 (3) [0]	18 (21) [1]	9 (18) [0]	5 (11) [0]
GHQ12—no distress (%)	67	32	79	46	51	65
PCL(C) \geq 50	1 (1) [19]	1 (2) [22]	1 (1) [17.5]	6 (7) [23]	3 (6) [23]	1 (2) [17]
PCL(C)—no distress (%)	36	20	50	17	33	53
Positive unit social support	80 (85)	49 (88)	68 (75)	80 (93)	28 (57)	40 (87)

'Unit social support' is distinct from 'feeling supported during the tour of duty' shown in Table 2.

$P < 0.01$) perceived less unit social support. Comparison of the PCL(C) and perceiving a support network during the tour for the Coldstream Guards ($r = -0.35$, $P < 0.05$) and between the PCL(C) and perceiving social support from unit members for the Royal Marines ($r = -0.28$, $P < 0.05$) and Coldstream Guards ($r = -0.32$, $P < 0.05$) showed those suffering higher levels of trauma-related stress perceived less social support from other unit members and less of a support network during the tour. We found no interaction post-deployment.

Discussion

This study has three principal findings. Firstly, the TRiM-experienced unit (Royal Marines) reported lower levels of psychological distress than the TRiM-naive unit (Coldstream Guards) both pre- and post-deployment. Secondly, we found reduced levels of anxiety in both groups within the first week post-deployment, compared with pre-deployment. Thirdly, personnel from both groups who reported significant levels of distress were less likely to perceive effective social support from their colleagues.

This study has a number of limitations; the most notable of these is that only small numbers of participants were included, especially during and following deployment when difficulties were encountered in locating individuals. Low numbers make it harder to draw firm conclusions as the study may be underpowered to detect differences between the groups. It was not possible to determine how long personnel had spent with their unit prior to deployment or whether they were new recruits; these factors may also have influenced perception of cohesion. Sampling was not random, but based on availability and would have excluded personnel absent for such reasons as physical or mental illness. Also since participants were all male these findings may not be directly rel-

evant to females. However, since most armed forces personnel are fit for duty, the results of this study should be applicable to most other military units.

Another limitation was that, in common with numerous other studies into psychological health [4,20], rather than actual diagnosed illness, we used self-report measures that are subjective and potentially open to interpretation. For instance, some respondents may have been reluctant to disclose psychological distress for fear of harming their career or personal standing within the group. Also subclinical indications of trauma-related stress were not included, which may have influenced findings. Although confounders were adjusted for and did not seem to greatly influence the results, this does not rule out the possibility that variables not measured, and therefore not adjusted for, may have influenced the findings, rather than TRiM itself.

In support of our first hypothesis, we found significantly higher levels of general and trauma-related stress prior to deployment in the Coldstream Guards than in the Royal Marines, suggesting that TRiM use might influence the prevalence of psychological distress. In support of our second hypothesis, we found that a difference between the groups remained in relation to general distress following deployment; the Coldstream Guards reported higher, although markedly reduced, distress than the Royal Marines although trauma-related stress levels were similar in both groups. Levels of general and trauma-related stress were reduced post-deployment as compared to pre-deployment, suggesting that both groups may have been resistant to the development of combat-related stress.

In keeping with previous research [17], we found no evidence that using TRiM was associated with inferior psychological health. These results concord with other research [22] which found an especially low prevalence of PTSD in Royal Marines personnel; perhaps because

using TRiM has become culturally acceptable, allowing early intervention for emerging issues, leading to lower reported levels of distress. However, we cannot rule out the possibility that differences may have been due to other factors, such as the Royal Marines' rigorous selection procedures, training and camaraderie which may also have exerted a confounding influence. Previous research [21] found higher levels of cohesion and less psychological vulnerability prior to selection within the Royal Marines than in army infantry units. However, whilst unit cohesion has been shown to protect mental health it may also inhibit disclosure of psychological problems; disclosure may be perceived as failing the group.

Anticipatory anxiety was a concern for both groups pre-deployment, supporting previous research [23,24]. Previously deployed personnel may recall prior traumatic events and those not previously deployed might fear the unknown or be overly concerned about how their friends and family might cope. Since more Coldstream Guards had spouses, partners and children, these factors may have elevated their level of anticipatory concern; other studies have also found that personnel about to deploy frequently report concern about their forthcoming separation from friends and family [25].

During deployment, the Royal Marines suffered three fatalities and both units experienced injuries, all events that involved TRiM utilization. However, low levels of distress were found post-deployment for both groups and our results found no suggestion of longer term psychological distress. Other studies have also found that, for UK military personnel, deployment does not necessarily lead to widespread psychological problems [26,27]. In fact, successfully mastering a stressful deployment may increase resilience and self-efficacy [25].

Social support during deployment can mitigate the effects of exposure to potentially traumatic events. However, our research findings on social support are not entirely clear-cut. For the majority of the Royal Marines, this was their first experience of combat. Perceptions of social support remained relatively high throughout, and in comparison to the Coldstream Guards, during deployment they indicated a higher perception of unit social support, in keeping with recent findings [21]. However, pre- and post-deployment, the Coldstream Guards' perceptions of social support were higher. This may have been influenced by more Coldstream Guards having previously deployed, possibly even serving together, but during deployment being isolated from other troops. As levels of combat decreased from mid-tour onwards, this change in potential danger may have encouraged increased bonding towards the latter end of the tour. Also, although TRiM was in its infancy for the Coldstream Guards, it may have begun to enter their culture and thereby encourage positive reinforcement.

Although the quality of available social support varied at times for both groups, the majority remained positive.

The current emphasis on targeting social support through the use of TRiM within military units supports the findings of other researchers [5,7,8,10] in showing social support to be an important predictor for suffering post-trauma reactions.

We conclude that personnel within the TRiM-experienced unit reported less distress than those in the TRiM-naive unit, although with TRiM implemented, the TRiM-naive unit experienced a marked reduction of distress. However, the results also suggest that those who experience higher levels of distress do so in the context of perceiving less social support. TRiM appears to have been associated with higher levels of social support for the TRiM-experienced unit during deployment, although not at other times. It may well be that TRiM functions more as a way of reassurance that there is a protective system in place and of providing psychologically relevant information rather than by direct facilitation of social support.

Given the high-intensity operations that the UK armed forces are currently conducting, we propose that these results should be somewhat reassuring as they suggest that TRiM may help ameliorate some of the adverse impacts of deployment. The use of TRiM in non-military organizations may also be beneficial, especially if employees are frequently exposed to potentially traumatic events; however, it should perhaps not be assumed that TRiM can readily be transferred to non-military organizations [28]. We acknowledge that more research is required to determine the link between potential organizational change and effective individual support, and also whether possible benefits of the TRiM system are related to the change of culture resulting from TRiM, or whether formal activation of TRiM is associated with the mainly positive findings reported here.

Key points

- Personnel in the Trauma Risk Management experienced units reported significantly less psychological distress than those in the Trauma Risk Management-naive units, suggesting that the use of Trauma Risk Management may benefit psychological health.
- Regardless of which unit personnel were in, those who reported having better social support reported lower levels of psychological distress.
- These data suggest that enhancing social support, through the use of Trauma Risk Management or otherwise, is likely to be beneficial for personnel who work in high-threat environments.

Conflicts of interest

Wendy Frappell-Cooke and Jamie Hacker Hughes work for the Defence Clinical Psychology Service, Joint Medical Command, Ministry of Defence. Neil Greenberg and Kevin Green are full-time members of the UK Armed Forces. The views expressed in this article are those of the authors and do not reflect the official policy or position of the Ministry of Defence. The Ministry of Defence was made aware of this paper before publication but did not mandate changes to the text.

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