OEM Online First, published on February 26, 2013 as 10.1136/oemed-2012-101229

ORIGINAL ARTICLE

Can mental health and readjustment be improved in UK military personnel by a brief period of structured postdeployment rest (third location decompression)?

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Received 9 October 2012
Revised 28 January 2013
Accepted 2 February 2013

ABSTRACT

Objective Third Location Decompression (TLD) is an activity undertaken by UK Armed Forces (UK AF) personnel at the end of an operational deployment which aims to smooth the transition between operations and returning home. We assessed whether TLD impacted upon both mental health and postdeployment readjustment.

Method Data collected during a large cohort study was examined to identify personnel who either engaged in TLD or returned home directly following deployment. Propensity scores were generated and used to calculate inverse probability of treatment weights in adjusted regression analyses to compare mental health outcomes and postdeployment readjustment problems.

Results TLD had a positive impact upon mental health outcomes (post-traumatic stress disorder (PTSD) and multiple physical symptoms) and levels of harmful alcohol use. However, when the samples were stratified by combat exposure, although postdeployment readjustment was similar for all exposure levels, personnel experiencing low and moderate levels of combat exposure experienced the greatest positive mental health effects.

Conclusions We found no evidence to suggest that TLD promotes better postdeployment readjustment; however, we found a positive impact upon alcohol use and mental health with an interaction with degree of combat exposure. This study suggests that TLD is a useful postdeployment transitional activity that may help to improve PTSD symptoms and alcohol use in UK AF personnel.

What this paper adds

- There is very little robust research data to support the use of early interventions following potential traumatic exposure.
- A number of occupational groups, including military personnel, are engaged in arduous and dangerous duties away from their homes for prolonged periods during which they are often exposed to potentially traumatic events.
- The UK military uses third location decompression (TLD) as a social, supportive and educational intervention following prolonged operational deployment.
- The current study suggests that TLD does not promote readjustment, but that it has a positive mental health effect which is related to the level of combat exposure experienced.
- TLD should continue to be used for deployed military personnel.

INTRODUCTION

Within the UK Armed Forces (UK AF), Third Location Decompression (TLD) is a postdeployment activity which, in recent times, has become a mandatory process for the majority of personnel who have undertaken an operational deployment. TLD aims to allow personnel to begin to psychologically 'unwind'[1] after deploying. It is the initial component of a comprehensive postoperational stress management (POSM) process[2] and marks the transition from being on operations to peacetime duties. Currently, the UK AF conducts TLD in Cyprus; this is a 'third location' in that it is away from the area of deployment but is not back at home. When initially established as a routine POSM process, TLD aimed to ensure that formed unit (FU) personnel who had deployed together were able to unwind together; however, since early 2011, and following an evaluation in those undertaking individual deployment, it has been Ministry of Defence policy that all personnel who deploy for longer than 30 days undertake TLD.[3] The standard TLD package lasts for approximately 24–36 h during which time attendees undertake a structured programme of activities including social events mostly centred on and around the local beach and a communal area developed to encourage a range of relaxing social and leisure activities. In addition, two distinct psychoeducational briefings are delivered prior to an evening barbeque and social event. The briefings describe the identification and management of mental health problems and provide information aimed to assist postdeployment readjustment including reintegration with family and friends; both aim to facilitate the homecoming transition. An opportunity for the limited consumption of alcohol is provided so that its effects can be experienced in a controlled environment following a prolonged period of abstinence.[4] Promoting controlled alcohol use is deemed important since alcohol misuse is prevalent among UK AF personnel.[5] Other nations, such as The Netherlands, France and Canada all make use of

To cite: Jones N, Jones M, Fear NT, *et al*. *Occup Environ Med* Published Online First: [*please include* Day Month Year] doi:10.1136/oemed-2012-101229

decompression in a variety of forms, but only Canada has published a review of their decompression arrangements.[6 7] Canada currently delivers a 3–5-day package in Cyprus where personnel are accommodated in hotels and are given spending money; French arrangements are for 3 days in Cyprus; the Dutch provide 3 days in Crete; Australia provides in-theatre rest with a psychologist interview when deployment is over, and the US provides a period of 'normalisation' in the home garrison prior to leave.

Given that TLD has been widely used within the UK AF following combat operations for a number of years without any evaluation of its effectiveness, this study aimed to compare mental health outcomes and readjustment in personnel who did or did not attend TLD.

METHOD

Study design and participants

This study used data collected during a UK-based cohort study of military personnel conducted by the King's Centre for Military Health using a self-report survey instrument.[8] Phase 1 of the cohort assessed the health of a randomly selected group of UK AF personnel (about 10%) deployed to the Iraq war (Operation TELIC) in 2003, and a randomly selected group of personnel who were serving but did not deploy. Approximately 4 years after the initial data collection, to ensure that it remained contemporary, two supplementary samples of personnel were recruited into the cohort.[9] The cohort sample consisted of the original 9395 individuals who had participated at phase 1 and were resurveyed at phase 2, 1789 randomly selected personnel who had deployed to Afghanistan between April 2006 and April 2007, and a replenishment sample of 6628 randomly selected individuals who had joined the UK AF since 2003 making a total of 17 812 subjects. Data collection for phase 2 began in November 2007 and ended in September 2009. A total of 9990 participants responded to the survey giving a final response rate of 56%. Response was associated with older age, being female, officer status and being a member of the Regular Forces. Non-response at phase 2 was not associated with mental health status (probable post-traumatic stress disorder (PTSD), common mental disorder (CMD), or alcohol misuse) at phase 1. Weights were created to account for sampling fractions and to account for response rate differences at phase 2.

For the purpose of the TLD study, subjects were recruited if they answered the cohort study question; 'after leaving theatre following the most recent (Afghanistan or Iraq) deployment, did you have a short period of time away from the operational area for you to relax before returning to your home base?' Subjects were excluded if they did not answer the question. Participants reporting a rest period were excluded if: the date of the rest period coincided with a period when TLD was known not to have taken place; if the date of attendance at TLD was not recorded, or the stated length of the rest period exceeded 3 days. This strategy was used to ensure that personnel were not describing any other form of postdeployment rest (TLD never exceeds a period of 3 days including travel to and from the TLD location). Some participants who did not record their attendance were included in the TLD sample if they had a valid record of attendance in a specific but separate TLD research study. Subjects were included in the control sample if they stated that they had not undertaken TLD when it was available but had deployed. Personnel were excluded from the control sample if their deployment took place when TLD was not available.

Most of the Royal Navy and Royal Air Force personnel who attended TLD prior to phase 2 of the cohort study were individual augmentees ('IAs' or personnel who deploy as individuals without the majority of their parent unit) who were either volunteers or those who had to attend because they were within a FU. Their attendance as IAs was only mandated from early 2011. These personnel, therefore, constituted a substantial number of the survey controls (n=1130), but a smaller number of TLD attendees (n=317). Royal Air Force (RAF) and Royal Navy (RN) units deploy and engage with TLD in a service-specific way compared with ground units and, overall, they face fewer operational threats than Army and Royal Marine personnel. In order to harmonise the comparison groups, RN and RAF personnel, but not Royal Marines, were excluded from the study a priori. The process for generating the TLD sample and the number of subjects excluded is shown in figure 1.

Self-rated general health was assessed with one question from the SF36. To assess subjective perceptions of health, we generated a variable where individuals rating their health as fair or poor were compared with those rating their health as good, very good or excellent.[10 11] Symptoms of CMD were measured with the 12-item General Health Questionnaire (GHQ-12)[12 13] where reporting four or more symptoms indicated CMD 'caseness'.

Probable PTSD was assessed with the 17-item National Centre for PTSD Checklist (PCL-C)[14] using a cutoff score of 50 or more to indicate PTSD caseness.

Alcohol use was assessed with the 10-item WHO Alcohol Use Disorders Identification Test[15] where scores of 16 or more indicated harmful alcohol use.

Physical symptoms were assessed using a 53-symptom checklist first used in a cohort study of Gulf War veterans[16 17] which was refined and used in phase 1 of the King's College cohort study of military personnel[8]. Cases of Multiple Physical Symptoms (MPS) were defined as individuals endorsing 18 or more symptoms representing the top decile of responses in phase 1 of the King's College cohort study.

Postdeployment readjustment was assessed using four questions extracted from an 11 item readjustment scale. The scale was generated from the results of pilot study interviews with additional advice from a sociologist to generate and refine the content of the deployment element of the King's cohort survey. Only four of these items asked directly about postdeployment readjustment, and were used in the current study. These were; 'I had no major problems on return from deployment' (this item was reverse scored); 'I found it difficult to adjust to being back home'; 'I found it difficult to resume my normal social activities', and 'I had other major problems on return from deployment'. A positive response to any of the questions was taken to mean that a readjustment problem had occurred and a binary variable reflecting whether readjustment was present was generated. Leadership was assessed using a four item measure developed for use with military personnel[18 19 20]. Combat exposure was assessed using 13 questions adapted from the combat experience scale.[21] Tertiles were generated from the summed scores for the combat exposure scale. The study groups were stratified by level of combat exposure.

As the subjects in this study were not randomised to receive TLD, we used propensity scores (PS) to minimise bias. The PS summarises the probability of intervention assignment conditional on observed baseline characteristics. It allows for the analyses of observational data so that some of the particular characteristics of a randomised controlled trial (RCT) are mimicked. The PS is a balancing score where the distribution of observed baseline covariates will be similar between attendees

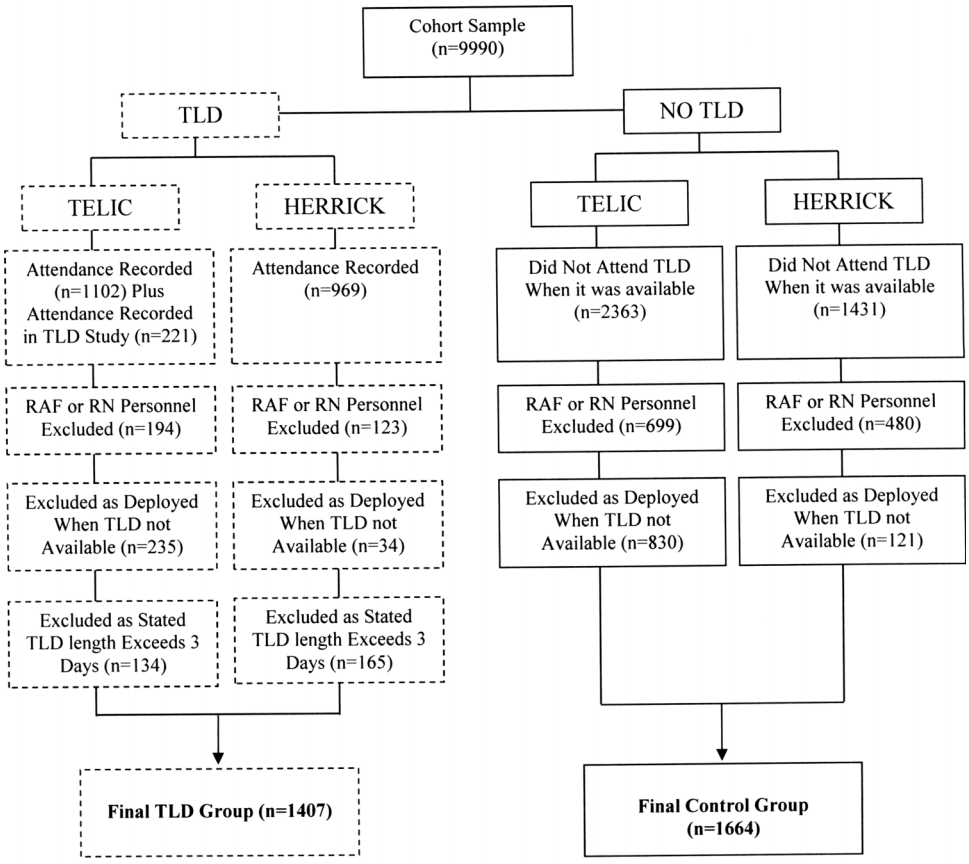

Figure 1 The process of generating the third location decompression study sample.

and non-attendees conditional on the PS.[22] We used a number of covariates as predictors of attending TLD, and generated PSs using the area of common support option in STATA; this allowed us to check that there were sufficient numbers of individuals who shared similar PSs among attendees and non-attendees.[23] Theoretically, many participants with the same PS will appear in the TLD attendance and non-attendance samples, therefore, the samples should be approximately balanced on the variables predicting the PS. The covariates used to generate the PS were: combat arm (combat personnel are those who engage the enemy, combat support arms are those who provide direct support to combat personnel, and combat service support arms are those who provide logistic, medical and general support). We used this variable as those with potentially higher rates of combat exposure might be directed to attend TLD. The remaining variables used were:

1. Younger versus older age (younger age groups are likely to be of lower rank and, therefore, less able to exercise choice in attending TLD).
2. Engagement type (reserves are less likely than regular forces personnel to be found in FUs and, therefore, are less likely to attend TLD).
3. IA or FU deployment (IAs at the time of data collection were less likely to attend TLD).
4. Being in a long-term relationship or not; leadership levels (good leaders are more likely to ensure that their personnel attend TLD).

Time since deployment

Although we knew the end dates of the various operational phases, military units return from deployment at various times over a 6-week period, and we could not therefore be precise about the exact date of TLD or return home, we therefore calculated the time since finishing the deployment in 3-month blocks, as we knew that individuals would have returned home at some time within the first 6 weeks of these blocks.

As sample sizes increase, the PS captures an incrementally greater amount of the variation in the covariates related to receiving TLD[24] and balances the distribution of the covariates across attendance and non-attendance.[25] We checked the balance of the model by ensuring that the distribution of the covariates was the same for attendance and non-attendance when the PS was applied. The diagnostic tests generated six strata of subjects, and each of the covariates was balanced across subjects in each of the strata indicating a robust model. The resulting PS, therefore, robustly summarised the chosen covariates as a single coefficient. The rank variable was not included as its distribution was unequal across the two samples and could not be balanced. We therefore controlled for this variable in the final analysis. Inverse probability of treatment weights (IPTW) were generated by dividing 1 by the PS for attendees, and 1 divided by 1 minus the PS for non-attendees. In theory, when the PS-derived IPTWs are applied, a pseudo-randomisation effect is achieved which helps to make causal inferences about receiving or not receiving TLD. We finally generated a composite weight by multiplying the sample and response weight described earlier by the IPTW.

Analyses were undertaken with the statistical software package STATA V.10.1. The analyses presented here used the survey command. All categorical variables were examined using Pearson's χ^2 Test using Scott and Rao's second-order correction to account for weighting.[26] Outcomes were examined using

IPTW weighted multivariable logistic regression to generate ORs with 95% CIs which were adjusted for rank, and the statistical significance of the effect of combat exposure was calculated through Wald's test. Weighted percentages and OR are presented throughout with unweighted cell counts.

RESULTS

To assess whether TLD promoted better readjustment and mental health in attendees, differences in postdeployment readjustment and longer-term mental health were examined. A total of 3071 personnel fulfilled the inclusion criteria; 45.8% (n=1407) were TLD attendees and 54.2% (n=1664) formed the non-intervention (control) group. There were no significant differences in the levels of postdeployment readjustment problems reported by TLD attendees and controls. There were, however, significant differences in probable PTSD; approximately 3.0% of TLD attendees reported PTSD compared with 4.5% of controls (AOR 0.57 95% CI 0.36 to 0.91); TLD attendees were significantly less likely than controls to report MPS caseness (6.6% vs 9.4%, AOR 0.65 95% CI 0.45 to 0.95). In addition, attendees were less likely than controls to report harmful levels of alcohol use (16.8% vs 19.5% of controls, AOR 0.74 95% CI 0.54 to 1.00). All other differences were not significant. The results of these analyses are shown in table 1.

The TLD group was younger and of lower rank than the control group; 46% (n=790) of the controls were aged 18–30 years compared with 55.4% (n=828) of the TLD attendees (p≤0.001); there were significantly more combat support arm personnel in the control group; 13.4% (n=208) of the controls were from the combat support arms compared with 8.3% (n=114) of the TLD attendees (p≤0.01). In all other respects, the sociodemographic characteristics of the two samples were not significantly different (table 2).

To assess whether differences in mental health status might be a potential source of bias, a comparison was made between the mental health status of the two groups at phase 1 of the cohort study for those subjects where data were available (TLD n=886, Control n=608). The results showed no significant differences between the two groups. Controls reported similar levels of PTSD to TLD attendees, (3.1% vs 3.1%, p=0.93), symptoms of CMD (20.8% vs 19.3%, p=0.60) and MPS caseness (9.1% vs 9.6%, p=0.82). Levels of harmful alcohol use were also similar in both samples (18.4% vs 20.0% of TLD attendees, p=0.56).

In analyses stratified by combat exposure, the main effect for TLD appeared to be within the medium combat exposure group

Table 1 Mental health outcomes third location decompression (TLD) attendees and controls

	Study group	
Outcome*	**Controls**	**TLD**
PCL-C score≥50		
Case (123)	68 (4.5)	55 (3.0)
No case (2813)	1583 (95.5)	1230 (97.0)
AOR (95% CI)	1	0.57 (0.36 to 0.91)
GHQ-12 4 symptom cutoff (CMD)		
Case (573)	355 (21.4)	218 (17.9)
No case (2350)	1293 (78.6)	1057 (82.1)
AOR (95% CI)	1	0.80 (0.56 to 1.13)
Multiple physical symptoms≥18 (MPS)		
Case (229)	140 (9.4)	89 (6.6)
No Case n (2488)	1381 (90.6)	1107 (93.4)
AOR (95% CI)	1	0.65 (0.45 to 0.95)
AUDIT score≥16		
Case (529)	285 (19.5)	244 (16.8)
No case (2382)	1355 (80.5)	1027 (83.2)
AOR (95% CI)	1	0.74 (0.54 to 1.00)
Health rating		
Excellent, very good or good (1408)	764 (45.2)	644 (48.7)
Fair or poor (1548)	894 (54.8)	654 (51.3)
AOR (95% CI)	1	1.14 (0.88 to 1.47)
Readjustment problems		
None (1501)	900 (51.2)	601 (51.5)
One or more (1393)	755 (48.8)	638 (48.5)
AOR (95% CI)	1	0.93 (0.72 to 1.20)

*All AORs adjusted for rank.
AUDIT, alcohol use disorders identification test; CMD, common mental disorder.

Table 2 Demographic characteristics of the third location decompression (TLD) and control samples

Sociodemographic factors	Controls n (%)†	TLD n (%)	p Value*
Age at phase 2 (years) (n=2971)			≤0.001
18–20 (120)	31 (2.1)	89 (3.3)	
21–25 (733)	319 (20.9)	414 (23.9)	
26–30 (715)	390 (23.0)	325 (28.2)	
31–35 (545)	339 (21.3)	206 (19.5)	
36–40 (510)	329 (20.6)	181 (18.4)	
41–45 (191)	138 (7.6)	53 (4.8)	
≥46 Years (157)	118 (4.6)	39 (1.9)	
Engagement type (3071)			0.6
Regular (2733)	1517 (94.3)	1216 (94.7)	
Reserve (338)	147 (5.7)	191 (5.3)	
Role (2971)			≤0.01
Combat (936)	385 (32.3)	551 (33.8)	
Combat support arm (322)	208 (13.4)	114 (8.3)	
Combat service support (1713)	1071 (54.4)	642 (57.9)	
Service (3071)			0.60
Army (2898)	1578 (95.7)	1320(95.3)	
RM (173)	86 (4.3)	87 (4.8)	
Sex (3071)			0.17
Male (2846)	1515 (94.5)	1331 (92.8)	
Female (225)	149 (5.5)	76 (7.2)	
Relationship status (2958)			0.3
In a long-term relationship (2157)	1248 (74.3)	909 (76.3)	
Not in a long-term relationship (801)	413 (25.7)	388 (23.8)	
Rank (2971)			≤0.0001
Senior officer (75)	67 (2.8)	8 (0.6)	
Officer (504)	337 (14.8)	167 (11.3)	
Senior non-commissioned officer (SNCO) (736)	486 (33.3)	250 (28.4)	
Junior non-commissioned officer (JNCO) (1020)	540 (33.4)	480 (39.1)	
Junior rank (636)	234 (15.6)	402 (20.5)	
IA vs FU personnel (2908)			0.51
FU personnel (2555)	1363 (87.7)	1192 (89.1)	
IA personnel (353)	291 (12.3)	62 (10.9)	

*p Values are for Pearson χ^2 test corrected for weighting using Rao and Scott second order correction.
†n's are shown without the composite weight applied, %s are shown with the composite weight applied.
FU, formed unit; IA, individual augmentees.

Table 3 Mental health outcomes third location decompression (TLD) attendees and controls stratified by combat exposure

Study groups stratified by combat exposure							
Outcome†	TLD high (n=542)	Controls high (n=380)	TLD medium (n=349)	Controls medium (n=535)	TLD low (n=357)	Controls low (n=737)	Wald test F p value
PCL-C score≥50							
Case n (%)	38 (5.7)	35 (9.0)	11 (1.8)	21 (4.7)	5 (0.9)	10 (1.4)	F=7.38 p≤0.001
No case n (%)	495 (94.3)	343 (91.0)	336 (98.2)	510 (95.3)	342 (99.1)	722 (98.6)	
AOR (95% CI)*	0.59 (0.32 to 2.00)	1	0.35 (0.14 to 0.88)	1	0.56 (0.14 to 2.24)	1	
GHQ-12 4 symptom cutoff (CMD)							
Case n (%)	107 (24.3)	100 (26.4)	54 (17.9)	115 (22.2)	49 (10.8)	137 (17.7)	F=3.64 p≤0.01
No case n (%)	420 (75.7)	278 (73.6)	291 (82.1)	416 (77.8)	296 (89.2)	592 (82.3)	
AOR (95% CI)	0.89 (0.52 to 1.54)	1	0.76 (0.42 to 1.39)	1	0.57 (0.33 to 0.96)	1	
Multiple physical symptoms≥18							
Case n (%)	58 (11.3)	48 (14.1)	19 (5.3)	48 (10.5)	10 (2.4)	44 (5.6)	F=6.14 p≤0.001
No case n (%)	444.(88.7)	306 (85.9)	303 (95.7)	437 (89.5)	308 (97.6)	629 (94.4)	
AOR (95% CI)	0.94 (0.55 to 1.59)	1	0.47 (0.23 to 0.93)	1	0.52 (0.21 to 1.26)	1	
AUDIT score≥16							
Case n (%)	131 (21.9)	96 (26.4)	59 (16.9)	99 (21.1)	41 (10.8)	89 (14.2)	F=4.05 p≤0.001
No case n (%)	394 (78.1)	281 (73.4)	284 (83.1)	429 (78.9)	303 (89.2)	635 (85.8)	
AOR (95% CI)	0.61 (0.35 to 1.14)	1	0.72 (0.41 to 1.29)	1	0.74 (0.48 to 1.13)	1	
Health rating							
Excellent, very good or good n (%)	281 (50.6)	172 (45.0)	172 (45.2)	246 (43.7)	164 (50.4)	338 (45.2)	F=0.63 p=0.68
Fair or poor n (%)	258 (49.4)	206 (55.0)	177 (54.8)	288 (56.3)	187 (49.6)	397 (54.8)	
AOR (95% CI)	1.24 (0.84 to 1.84)	1	1.06 (0.69 to 1.63)	1	1.20 (0.75 to 1.91)	1	
Readjustment problems							
None n (%)	203 (37.0)	137 (34.8)	177 (51.5)	270 (44.9)	216 (68.5)	487 (65.7)	F=17.49 p≤0.001
One or more n (%)	337 (63.0)	241 (65.2)	166 (48.5)	262 (55.2)	130 (31.5)	246 (34.3)	
AOR (95% CI)	0.88 (0.59 to 1.32)	1	0.75 (0.48 to 1.16)	1	0.82 (0.50 to 1.36)	1	

*All AORs adjusted for rank.
†n's are shown without the composite weight applied, %s, AOR and 95% confidence intervals are shown with the composite weight applied.
AUDIT, alcohol use disorders identification test; CMD, common mental disorder; TLD, third location decompression.

where attendees were less likely than controls to report probable PTSD symptoms (1.8% vs 4.7% AOR 0.35 95% CI 0.14 to 0.88) and MPS (5.3% vs 10.5% AOR 0.47 95% CI 0.23 to 0.93). Within the lowest combat exposure groups, attendees were less likely to report symptoms of CMD (10.8 vs 17.7% AOR 0.57 95% CI 0.33 to 0.96). There were no significant differences in the high combat exposure group, and levels of harmful alcohol use were evenly distributed across all groups. The effect of stratifying by combat exposure was significant for each dependent variable with the exception of global health rating (table 3).

DISCUSSION

This study evaluated the impact of TLD upon postdeployment readjustment and mental health among deployed UK AF personnel. It would have been preferable to conduct a prospective RCT but, when data collection for the cohort study took place, TLD was not mandatory, however, at the time of the current study it had become so, therefore, we could not make use of randomisation. We chose a method of analysis that minimises bias in observational studies. Our main findings were that TLD attendees reported similar levels of readjustment difficulties to non-attendees irrespective of the level of combat exposure. However, TLD appeared to reduce the incidence of PTSD, MPS and harmful alcohol abuse in some groups.

The UK AF policy of providing TLD is intended to promote readjustment following operational deployment, so that attendees experience a smoother transition than those returning directly to their home location. Our results suggest that this may not occur. In our previous studies of TLD[4 3] (Jones *et al* 2011), we demonstrated that the majority of personnel find TLD useful upon completion, but have always cautioned that there is no guarantee that this will predict better readjustment; our caution appears warranted. However, TLD appeared to reduce the incidence of PTSD and MPS, and was also helpful in reducing harmful alcohol use. The effects upon PTSD were apparent in those experiencing moderate levels of combat exposure and a positive effect upon general mental health was seen in those reporting low levels of combat exposure.

It is difficult to explain why a social intervention based upon the promotion of rest and readjustment should have a differential effect which is moderated by combat exposure. Increased levels of combat exposure have been linked to the development of PTSD[21] and intuitively, personnel reporting high levels of these experiences might benefit from the opportunity to 'decompress' and begin the cognitive processing of difficult deployment experiences before returning home. Our data suggest that those reporting moderate levels of combat exposure may have the most to gain from TLD attendance in terms of reduced levels of PTSD symptoms. It may be that personnel with more PTSD symptoms in the high-exposure group may be limited in their ability to engage with the TLD process; this may relate to intrusive PTSD symptoms, difficulties with concentration and, therefore, a reduced ability to engage with the psychoeducation elements. They may also have found avoidance to be a problem particularly with respect to social interaction;

by contrast, the low-exposure group may have found TLD less relevant as they had fewer symptoms. We have some evidence from our previous TLD survey[4] that the journey from theatre to Cyprus can be stressful and subject to considerable air transport delay. Fatigue arising from transport problems may further compound the effects of experiencing traumatic stress symptoms, which are more common in combat-exposed personnel. This might further hinder the ability to process the briefing information and, crucially, to reduce engagement with the TLD process overall.

In our study of subjective impressions of TLD,[27] personnel sometimes viewed the process as an impediment to homecoming rather than an important transition. This may further inhibit commitment to the process and reduce potential gains for some. Intuitively, one possible solution to this might be to adopt a nuanced approach to TLD briefings where lower combat exposed units receive standard briefing and combat exposed units receive a briefing which focuses on PTSD symptom management and treatment seeking. This message can be reinforced during the longer-term normalisation period conducted in the home garrison. The UK's postdeployment briefing was standardised in 2008, and it may well be that some personnel attending earlier TLD received less well-formulated briefings which may have influenced some of our findings.

Dealing with potentially harmful alcohol use is a major component of postdeployment psychoeducational briefs, and alcohol use is managed in a controlled way during TLD. In our study of UK Battlemind,[28] which is a standardised postdeployment briefing package which emphases skills acquisition as well as providing information, we found that Battlemind was superior to standard briefing in reducing binge drinking when measured 4–8 months after TLD. As a result of the trial, Battlemind elements have been incorporated in the UK AF's standard TLD briefing package, and we speculate that this may have further contributed to reduced alcohol misuse. By contrast with the results of a study of US Battlemind,[29] we did not find a positive mental health effect for those reporting higher levels of combat exposure.

In other studies,[20] we have demonstrated that leadership, morale and cohesion are strongly associated with good mental health. In this study, TLD had a benefit over and above good leadership, and we suggest that it should be an additional strategy that may further enhance the positive mental health effects of good leadership.

It may be that the current UK TLD model is not the best approach to managing postdeployment transition, and that coalition partner models should be considered when their research findings become available. It is worth noting however, that we found no evidence in our data that the mental health briefs or attendance at TLD overall was harmful.

Overall, it appears that TLD attendance may help to reduce harmful levels of alcohol use, and it appears to have a positive effect PTSD, physical symptoms and symptoms of CMD in those reporting moderate or low levels of combat exposure. Clearly, the benefits of TLD are not mediated through promoting better postdeployment adjustment, and this study is unable to clarify whether controlled drinking during TLD, the mental health briefings, or some other element of the TLD process helped in this regard.

STUDY LIMITATIONS

The use of IPTWs calculated from PSs to produce 'pseudo-randomisation' allowed us to infer that TLD may have had an effect independent of confounding variables; in effect, the methodology allows us to propose tentative causal inferences. By applying IPTWs, we were able to ensure that the samples were weighted to reduce selection bias. We were able to adjust for a range of known confounders, such as age and engagement type, so that any observed effect is more likely to have arisen from TLD. It is possible however, that our assumption of unobserved confounding is incorrect, and that there is unaccounted for or hidden bias. Bias, which could be resolved by randomisation, might include that which arises from personnel avoiding undertaking TLD by choice or influence, or being channelled to undertake TLD by commanders. Given that all variables used to calculate PS were measured after TLD, it may have affected the subjective impression of some variables, such as the quality of leadership. The time from end of deployment to follow-up differed between the two groups (TLD attendees mean=9 months, SD 8 months and controls mean=17 months SD 11 months). However, this was accounted for in the generation of PSs. This study examined the UK AF version of TLD which differs in length and content from that delivered by coalition partners; we therefore suggest caution in generalising the results to other models of TLD. A small number of personnel also took part in our study of UK Battlemind, and there is a possibility that this influenced the findings. As Royal Navy and RAF personnel were excluded from the analyses, we cannot generalise our findings to these personnel. Finally, it is possible that our measures of postdeployment adjustment did not target important areas of homecoming, and thus, failed to measure positive adjustments other than those we asked about.

CONCLUSION

This study examines the effectiveness of TLD. Our findings are important, as TLD is now a mandatory activity for the majority of UK AF personnel deployed on operations, and has been widely implemented by a number of coalition partners. There is a generally held view that TLD will assist with postdeployment readjustment, and will support mental health in military personnel. While we found evidence to support the second claim we did not find any to support the first. However, importantly, given its mandatory nature, neither did we find substantial evidence of harm in attendees. We have previously suggested that TLD attendance should be decided upon at an individual or unit level taking account of factors, such as length of deployment and combat exposure.[27] We found some further evidence to support that view in this study. We therefore restate our views about taking a nuanced approach to TLD where personnel who have experienced high levels of combat may need greater support to address their mental health and readjustment needs, whereas those reporting lower levels of combat seemed to benefit from the standard TLD approach. We suggest that when promoting TLD, commanders should be wary about making excessive claims that it promotes better readjustment as, in this study, it did not appear to do so. There is some evidence that TLD has mental health benefits, however, TLD alone cannot positively affect mental health, and it is but one component of the postdeployment reintegration package. Many organisations deploy their personnel away from home in adverse circumstances, including diplomatic staff, journalists, emergency responders and police liaison officers, and we suggest that a rest, support and information-giving process, which may or may not take the form of TLD, may be an important step in decoupling from their duties. Indeed the Ministry of Defence (MOD) has now mandated TLD for civilian staff deployed to combat zones. Finally, we suggest that further prospective research be undertaken to ensure that future policy regarding TLD is based

upon a robust evaluation, and that this should take the form of a RCT.

Funding This study was funded by the UK Ministry of Defence.

Competing interests NG and MF are full-time members of the UK Armed Forces. NJ is a full-time reservist. NG, MF and NJ are currently seconded to King's College London. NTF, SW and MJ are employed by King's College London which receives funding from the UK Ministry of Defence. SW is also honorary civilian consultant advisor in psychiatry to the British Army and is a trustee of Combat Stress, a UK charity that provides service and support for veterans with mental health problems.

Patient consent Obtained.

Ethics approval Ministry of Defence Research Ethics Committee, King's College London Research Ethics Committee.

Provenance and peer review Not commissioned; externally peer reviewed.

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Occup Environ Med published online February 26, 2013
doi: 10.1136/oemed-2012-101229