

Rest and recuperation in the UK Armed Forces

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Background	Recent epidemiological evidence suggests that military personnel commonly remain psychologically resilient in the face of adversity they face on deployment. However, the processes that promote resilience have not been well assessed within the UK military. For many years, the UK Armed Forces have operated a policy of rest and recuperation (R&R), which refers to the brief period during which troops return home when on an operational tour of duty. While R&R is thought to play an important role in promoting recovery and well-being, there is as yet no empirical evidence to support its effectiveness.
Aims	To explore whether R&R promotes well-being and recovery from the strains of deployment in military personnel.
Methods	Participants completed self-report measures of mental health and exposure to potentially traumatic events (PTEs), as well as an R&R Recovery Questionnaire (R&RRQ).
Results	Statistical analysis indicated that the R&RRQ was a reliable measure within the sample of 97 subjects. Participants who reported recovery following R&R reported fewer symptoms of mental health difficulties. However, increased deployment exposure to PTEs was associated with feeling less recovered at the end of R&R.
Conclusions	These preliminary data suggest that R&R can be useful for troops if they can use the time to recover. This study's results are relevant to policymakers and leaders in the military and other groups placed in challenging environments but more work is needed to understand how R&R works and to maximize its capacity to promote well-being among military personnel.
Key words	Leave; mental health; military; PTSD; R&R; recovery.

Introduction

The last decade has seen an increasing requirement for the UK Armed Forces (UKAF) to carry out high-intensity operational duties that have led to the death and serious injury of some personnel [1]. The nature of these duties has created considerable media and political interest in the psychological well-being of deployed military personnel [2]. There has also been recent interest in the effect of exposure to potentially traumatic events (PTEs) in non-military personnel, such as diplomats and journalists, working in conflict zones, with research indicating that deployment can also adversely affect the mental health of this population [3,4].

The UKAF have established a number of measures designed to minimize negative mental health effects in deployed personnel. One of these is the rest and recuperation (R&R) programme. R&R gives personnel the

opportunity to return home to recover physically and mentally from the strains of deployment and to maintain links with friends and family and has long been a feature of operational tours of duty. The Ministry of Defence considers the primary aim of R&R is to promote the operational effectiveness and the well-being of deployed personnel challenged by arduous service, by providing a period of time away from operations [5].

For UK personnel, R&R usually lasts between 10 and 14 days and occurs once during a 6-month tour of duty. R&R slots become available between the first 6 weeks and the last 6 weeks of an operational tour. To maintain sufficient numbers of unit personnel available for duty, R&R slots are allocated by those in command according to a pre-determined programme that can be adjusted to take into account an individual's personal circumstances

(for example the anticipated birth of a child). Similar R&R policies exist in other military forces including the USA and Canada. However, US forces generally take R&R for a similar period of time but after 6 months [6]. Despite the acknowledged psychological impact on military personnel of exposure to combat-related trauma [7,8] and the part that R&R is thought to play in promoting operational effectiveness and offsetting the negative mental health effects of deployment, to date there is little evidence on whether it achieves either outcome.

This study had three objectives. Firstly to develop a measure of experiences of and satisfaction with R&R; secondly to investigate whether respondents who felt recovered at the end of R&R reported better mental health and lastly to investigate the relationship between exposure to PTEs and mental health outcomes after a period of R&R.

Methods

Participants were recruited following a period of R&R at Royal Air Force (RAF) Brize Norton, the military air terminal from which passenger flights to operational missions depart. The sample consisted of UKAF personnel currently deployed on Operation HERRICK, the UK military mission to Afghanistan, which commenced in 2002. Participants completed the Rest and Recuperation Recovery Questionnaire (R&RRQ). This was based on similar validated questionnaires (e.g. Recovery Experience Questionnaire [9] and Client Satisfaction Questionnaire [10]) and was developed in conjunction with a literature review and two focus groups of 12 military personnel. A draft version was piloted with eight more personnel and it was modified to increase comprehensibility. The final version included 30 items covering six components: relaxation, physical recovery, psychological detachment, social support, satisfaction with travel back to the UK to start R&R and overall satisfaction with R&R. Participants also completed a demographics questionnaire, measures of exposure to potentially traumatic combat events questionnaires (adapted from the Combat Experience Scale [11], the General Health Questionnaire (GHQ-12) [12], the post-traumatic stress disorder (PTSD) Symptom Checklist Civilian version (PCL-C) [13] and the Alcohol Use Disorders Identification Test (AUDIT) [14]. Those scoring four or more on the GHQ-12 were classified as cases. On the PCL-C, a case was defined as those scoring 50 or more and on the AUDIT questionnaire, a case was defined as scoring 16 or more. Overall, the questionnaire booklet took between 10 and 20 min to complete.

Analyses were carried out using SPSS 16. Statistical significance was defined at the level of $P < 0.05$. Missing data were replaced with linear interpolations. Data were assessed for normality of distribution and where outliers were detected, these variables were Winsorized. Data met assumptions of normal distribution for R&RRQ,

GHQ-12 and AUDIT scores. While PCL-C scores indicated three outliers and a positively skewed distribution ($z = 12.01$, $P < 0.01$), this is in line with the 4% prevalence rate of PTSD in military populations [1]. In light of this, PCL-C scores were not transformed and non-parametric tests were used when this variable was involved in the analyses. R&RRQ was examined with a principal component analysis (PCA) using oblique (promax) rotation in order to identify a suitable structure such that each item would only load highly onto one component. Kaiser's criterion [15] for factor extraction was used as a confirmatory method in conjunction with a visual inspection of the scree plot. To help improve factor stability, each component contained at least three items with loadings >0.60 [16]. The associations between recovery from deployment on R&R, exposure to PTEs and mental health outcomes were examined using simple and multiple regression analyses. Due to the small number of PTSD cases, the study did not have sufficient power to treat PCL-C as a dichotomous variable; therefore, PCL-C scores were classified into two categories: (i) $PCL-C \geq 30$, suggesting impairment due to symptoms of PTSD and (ii) $PCL-C < 30$, suggesting no impairment. These variables were then used in a binary logistic regression. GHQ-12 and AUDIT scores were examined using simple and multiple regression analyses.

All completed questionnaires were treated as confidential and only the research team had access to completed questionnaires. Ethical approval was obtained from Royal Holloway University of London Research Ethics Committee and the Ministry of Defence Research Ethics Committee. Given the concern military personnel have about their career and deployability, participants were given the option to complete the questionnaire anonymously and supplied with an information pack on the study.

Results

A total of 174 personnel were invited to participate. Thirty-six declined to do so (21%) and 23 agreed but returned questionnaire booklets unanswered (13%). One hundred and fifteen completed questionnaires were received giving an overall response rate of 66%. In total, 18 questionnaires were excluded from the sample due to inconsistencies in responses that indicated that the subjects had not read questions correctly, leaving a total sample of 97. Army personnel made up 90% of the sample ($n = 87$) and 10% were in the RAF ($n = 10$). Table 1 compares the sample with Defence Analytical Services Agency (DASA) figures [17].

Table 2 reports data relating to experiences on deployment. Main bases are relatively safe areas compared with forward bases, which are more exposed and more likely to be directly attacked. A combat role includes infantry, armour or support arms serving with a combat unit.

Table 1. Key characteristics of the study sample compared with 2012 DASA figures

	Study sample, <i>n</i> (%)	DASA figures, <i>n</i> (%)
Gender^a		
Male	92 (97)	95 680 (92)
Female	3 (3)	8570 (8)
Rank		
Junior ^b	61 (63)	89 780 (86)
Senior ^c	36 (37)	14 480 (14)

^aMissing data = 2.^bJunior = Marine, Lance Corporal, Corporal.^cSenior = Sergeant and above.**Table 2.** Deployment characteristics of the study sample

	<i>n</i> (%)
Number of full weeks in theatre of operations^a	
0–16	25 (26)
17–26	59 (63)
27+	10 (11)
Location^b	
Check points	14 (15)
Patrol bases	20 (22)
Forward operating bases	14 (15)
Main bases	45 (48)
Main role^c	
Combat arm	37 (39)
Combat support arm	22 (22)
Combat service support	37 (39)

^aMissing data = 3.^bMissing data = 4.^cMissing data = 1.

A combat service support role includes logistics, medical personnel, military police and a combat support role includes artillery, combat engineers and intelligence.

Table 3 reports the percentage of the study sample that had experienced PTEs while deployed.

Mental health outcomes are reported in Table 4 and are compared with rates reported in previous studies.

Overall seven items were deleted from R&RRQ and the PCA produced a total of six components that explained 71% of the variance. These six components were (i) psychological detachment (four items); (ii) R&R satisfaction (five items); (iii) social support (four items); (iv) physical recovery (four items); (v) travel experiences (three items) and (vi) relaxation (three items). Analysis indicated that the R&RRQ scores were normally distributed.

Cronbach's α showed high reliability for the overall measure at 0.84, as well as for each of the six components, all of which achieved values >0.74 (Table 5, available as Supplementary data at *Occupational Medicine* Online). The mean inter-item correlation was 0.19, which was low but within the recommended range of 0.15–0.50 [18].

Table 3. Potentially traumatic events encountered on deployment

	<i>n</i> (%)
Thought you were in serious danger of being injured or killed	65 (67)
Received small arms fire	58 (60)
Seen dead or seriously injured friendly forces personnel	46 (47)
Received incoming artillery, rocket or mortar fire	43 (44)
Had an improvised explosive device or booby trap explode near you	37 (38)
Encountered hostile or aggressive reactions from civilians	31 (32)
Shot at the enemy with your personal weapon	31 (32)
Encountered enemy sniper fire	24 (25)
Had a mate injured or killed who was near you	23 (24)
Cleared/searched home or buildings, caves or bunkers	23 (24)
Provided aid to the wounded	23 (24)
Been threatened and were unable to respond because of the rules of engagement	18 (19)
Seen injured or sick women or children who you were unable to help	17 (18)
Handled or discovered human remains	16 (17)
Had a close call where a shell, rocket or missile that failed to explode landed near you	7 (7)
Engaged in close quarter battle with fixed bayonet	5 (5)
Been wounded or injured	4 (4)
Had equipment shot off your body or you were shot or hit but protective gear saved you	2 (2)

Table 4. Distribution of caseness on main outcome measures across studies

Study measure	Current study (<i>n</i> = 97); <i>n</i> (%)	Fear <i>et al.</i> [1] (<i>n</i> = 5743); <i>n</i> (%)	Hotopf <i>et al.</i> [20]; <i>n</i> (%)
PCL-C \geq 50 symptoms	3 (3)	222 (4)	<i>n</i> = 4613; 201 (4)
GHQ-12 total \geq 4 symptoms	16 (17)	1074 (20)	<i>n</i> = 4631; 953 (20)
AUDIT total \geq 8 symptoms	13 (13)	881 (16)	<i>n</i> = 4637; 1183 (22)

The internal reliability of the measure was greatest if all 23 items were kept, as alpha consistently fell below the full-scale alpha of 0.84 if any of the items were deleted. Item total correlations, which evaluate the performance of each question, showed that 11 items achieved very good discrimination (>0.40) and 10 items achieved good discrimination (between 0.20 and 0.39). Two items demonstrated poor discrimination (items 21 and 30), suggesting that their performance in future studies should be carefully considered.

A Flesch–Kincaid readability test, used to ensure R&RRQ was accessible to the range of reading abilities found within the UKAF, achieved a score of 91% (very easy to read).

The results showed that feeling more recovered following R&R was significantly associated with PCL-C scores <30 ($\beta = -0.11$, $SE = 0.03$, $P = 0.01$). The odds of a participant achieving a PCL-C score ≤ 30 and feeling recovered were 1.1 times higher than those of a participant achieving a PCL-C score >30 (Table 6).

Analyses showed that feeling more recovered following R&R was associated with lower scores on GHQ-12 ($R^2 = 0.20$, adjusted $R^2 = 0.19$; $F(1,95) = 23.68$, $P < 0.001$). It also found that feeling more physically recovered after R&R was associated with lower scores on GHQ-12 ($B = -0.35$, $\beta = -0.06$, $t(90) = -2.12$, $P < 0.05$); relaxation, social support, psychological detachment, satisfaction with travel and satisfaction with R&R were not independently associated with GHQ-12 scores.

The results also showed that feeling more recovered following R&R was associated with lower scores on AUDIT ($R^2 = 0.07$, adjusted $R^2 = 0.06$; $F(1,95) = 6.87$, $P < 0.01$). However, the analyses did not find any specific R&R activity or experience to be associated with AUDIT scores ($R^2 = 0.10$, adjusted $R^2 = 0.04$; $F(6,90) = 31.58$, $P = NS$).

Analyses found that exposure to a greater number of PTEs were associated with lower scores on R&RRQ. Specifically, the results showed that greater exposure to PTEs was significantly associated with engaging in fewer activities involving social support and friends ($R^2 = 0.11$, adjusted $R^2 = 0.10$; $F(1,95) = 11.93$, $P < 0.001$); relaxation, physical recovery, psychological detachment, satisfaction with travel and satisfaction with R&R were not independently associated with exposure to PTEs.

Discussion

There were a number of key findings. Firstly, we found that the R&RRQ demonstrated good psychometric properties and was a reliable measure within the current sample. Secondly, we identified that those who reported feeling recovered, particularly physically recovered, enjoyed better mental health than those who did not. Finally, we found that being exposed to a greater number of PTEs was associated with feeling less recovered at the end of R&R, perhaps because of engaging in fewer activities involving social support during R&R, which may be because greater exposure to PTEs reduces the ability to engage with such support.

A particular strength of this study was the use of empirical data regarding the relationships between R&R,

recovery and mental health. The R&RRQ was developed *via* a focus group and it was piloted to ensure good content validity. Results showed it was reliable and was easily accessible to a range of reading abilities found within the UKAF. Another strength was the use of comparable mental health outcome measures [1] that helped to demonstrate the validity of our results, although it was only possible to compare with studies of the state of UK military health in general as no prior studies had looked at R&R in detail. This study also showed a comparable response rate to previous studies [1,19] although the sample sizes in these studies were considerably larger than ours and the two comparator studies were of a representative sample of the UKAF, whereas the R&R sample consisted only of deployed personnel so comparisons should be tentative.

The limitations of this study included the use of a cross-sectional design limiting the ability to infer causality. Additionally, it was not possible to assess the test-retest reliability of R&RRQ. Similarly, we have no baseline data and it is not possible to comment upon the contribution of mental health symptoms at the beginning of R&R to those on completion and also on the ability to engage with R&R. The small sample size might have affected the investigation of the psychometric properties of R&RRQ, reduced statistical power and raised the possibility of type II error. However, our rates of caseness were similar to other studies [20], though the R&R sample consisted of deployed personnel only. Furthermore, the findings may not be applicable to the UKAF as a whole, as the study sample comprised mainly Army personnel with a few RAF personnel and no members of the Royal Navy. It also differed substantially in the rank and sex of participants compared with DASA figures. Lastly, there was no information on those who refused to participate or who returned unanswered questionnaire booklets, which raises the possibility of response bias. Since the focus of this study was the effectiveness of R&R on recovery further understanding of the negative impact of family events, anxieties about a return to duty and their relationship to PTSD symptoms is required.

Bearing in mind the exploratory nature of this study and its limitations a number of tentative conclusions can be made relevant to military and other organizations working in conflict zones. The data suggest that while on R&R personnel should be encouraged to engage in recovery promoting activities, including maximizing opportunities for sleep and physical rest. We suggest that the time allowed for R&R is sufficient to achieve recovery if utilized effectively. For instance Hahn *et al.* [21] developed a 2-day recovery training programme for public and private sector employees and showed there is potential for individuals to enhance their off-work recovery activities and experiences to impact positively on measures of well-being. However, it is possible that personnel with mental health symptoms cannot engage

Table 6. Results from logistic regression analyses

PCL scores	n (%)	OR (95% CI)	P value
<30	82 (84)	1	–
>30	15 (16)	1.12 (1.05–1.20)	<0.05

OR, odds ratio; CI, confidence interval.

effectively with R&R because of these symptoms, which suggests they may need to be supported to find some way of managing their symptoms so that they can make the best use of R&R.

Our results also suggest that those exposed to high degrees of combat-related potentially traumatic events on deployment were less likely to engage in activities with their social network. This seems important given that other studies from the general psychological and recovery literature have consistently shown that the experience of positive social support is linked to good mental health [22,23]. Therefore, there might be some benefit in facilitating the reunion of military personnel with their family and friends, for example by assisting personnel in identifying which aspects of their social environment they find most supportive and subsequently maximizing such opportunities. It might also be that some specific briefings could be developed for R&R returnees and their families to help them reintegrate and speak about the PTEs they experienced while away. It is possible that our finding that more PTE exposure was associated with less positive social support might be a result of service personnel not sharing their experiences because of not wanting to worry those they care about.

This is one of the first known studies to examine military personnel's perceptions of R&R and its impact on mental health and recovery while deployed in Afghanistan. We suggest that future research should address the further refinement and validation of R&RRQ, which could also be adapted to examine this topic in non-military groups. Consideration should be given to the components of psychological detachment, satisfaction with travel and satisfaction. Together psychological detachment and satisfaction explained the greatest amount of variance and had the highest item loadings (Cronbach's α of 0.93 and 0.84, respectively) and satisfaction achieved the highest item total correlations. However, despite the literature suggesting that both should be related to mental well-being [24,25], neither were significant predictors of mental health. Future research could consider alternative approaches to measuring satisfaction with R&R as well as exploring the contribution of different types of psychological detachment to recovery on R&R [26]. It is also possible that R&RRQ omitted important R&R recovery concepts as it was based on literature drawn from civilian rather than military populations. However, the piloting of the survey instrument and focus groups may have mitigated some of this. This could be addressed by inclusion of other recovery concepts, such as mastery experiences and control over leisure time [21]. It is also possible that the outcome measures adopted by this study should be reconsidered, as it may be more relevant to R&R to evaluate sleep, functional impairment or operational effectiveness upon return to operations. Finally, future research should adopt a within-subjects design with

baseline data gathering and a follow-up component in order to investigate whether R&R has the capacity to promote recovery from deployment and positively influence the mental well-being of military personnel.

In conclusion, this study set out to address the lack of research evaluating R&R. To this end, R&RRQ was developed and while results demonstrated good psychometric properties it requires further refinement and validation. The findings also showed that feeling recovered following R&R was associated with better mental health, while exposure to combat-related PTEs was associated with feeling less recovered in this military sample. These preliminary data suggest that R&R is indeed useful but more work is needed to understand how it works and to maximize its capacity to promote well-being among military personnel.

Key points

- Individuals in the military who are able to engage with the rest and recuperation process appear to benefit from it psychologically.
- Those who are exposed to numerous potentially traumatic experiences while deployed are less likely to benefit from rest and recuperation as they appear to have difficulty in utilizing social support.
- It is possible to measure the various domains of rest and recuperation using self-report questionnaires.

Conflicts of interest

M.F. and N.J. were employed by the Ministry of Defence.

References

1. Fear NT, Jones M, Murphy D *et al.* What are the consequences of deployment to Iraq and Afghanistan on the mental health of the UK Armed Forces? *Lancet* 2010;**374**:1783–1797.
2. Jones N, Greenberg N, Fear NT *et al.* The operational mental health consequences of deployment to Iraq for UK Forces. *J R Army Med Corps* 2008;**154**:102–106.
3. Browne T, Evangeli M, Greenberg N. Trauma-related guilt and posttraumatic stress among journalists. *J Trauma Stress* 2012;**25**:207–210.
4. Hibberd JM, Greenberg N. Coping with the impact of working in a conflict zone: a comparative study of diplomatic staff. *J Occup Environ Med* 2011;**53**:352–357.
5. Joint Services Publication (JSP) Number 760. *Tri-service Regulations for Leave and Other Types of Absences*. London: Ministry of Defence, 2011. <https://www.gov.uk/government/publications/jsp-760-tri-service-regulations-for-leave-and-other-types-of-absences> (05 October 2013, date last accessed)
6. United States DoD Directive 1327.5. *DoD Policy on Leave and Liberty*. Washington, DC: US Department of Defense, 2009, incorporating Change 2, effective August 13, 2013.

- <http://www.dtic.mil/whs/directives/corres/pdf/132706p.pdf> (19 August 2014, date last accessed).
7. Greenberg N, Iversen A, Hull L, Bland D, Wessely S. Getting a peace of the action: measures of post traumatic stress in UK military peacekeepers. *J R Soc Med* 2008;**101**:78–84.
 8. Wells TS, LeardMann CA, Fortuna SO *et al.*; Millennium Cohort Study Team. A prospective study of depression following combat deployment in support of the wars in Iraq and Afghanistan. *Am J Public Health* 2010;**100**:90–99.
 9. Sonnentag S, Fritz C. The Recovery Experience Questionnaire: development and validation of a measure for assessing recuperation and unwinding from work. *J Occup Health Psychol* 2007;**12**:204–221.
 10. Attkisson CC, Zwick R. The client satisfaction questionnaire. Psychometric properties and correlations with service utilization and psychotherapy outcome. *Eval Program Plann* 1982;**5**:233–237.
 11. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *N Engl J Med* 2004;**351**:13–22.
 12. Goldberg DP, Williams P. *A Users' Guide to the General Health Questionnaire*. Windsor: NFER-Nelson, 1988.
 13. Weathers F, Litz B, Herman D, Huska J, Keane T. *The PTSD Checklist—Civilian Version (PCL-C)*. Boston: National Centre for PTSD, 1994.
 14. Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG. *The Alcohol Use Disorders Identification Test: Guidelines for use in primary care* (2nd edn.). Geneva: World Health Organisation, Department of Mental Health and Substance Dependence, 2001.
 15. Kaiser HF. The application of electronic computers to factor analysis. *Edu Psychol Meas* 1960;**20**:141–151.
 16. Anderson TW, Rubin H. Statistical inference in factor analysis. *Proc Third Berk Symp Math Stat Prob* 1956;**5**:111–150.
 17. Defence Analytical Services and Advice. *MOD Armed Forces Personal Statistics: Statistical release*. 2012. <http://www.dasa.mod.uk/applications/newWeb/www/index.php?page=-48&pubType=1&thiscontent=280&PublishTime=09:30:00&date=2012-05-17&disText=2012&from=listing&topDate=2012-05-17> (11 February 2011, date last accessed)
 18. Clark LA, Watson D. Constructing validity: basic issues in objective scale development. *Psychol Assess* 1995;**7**:309–391.
 19. Hotopf M, Hull L, Fear NT *et al.* The health of UK military personnel who deployed to the 2003 Iraq war: a cohort study. *Lancet* 2006;**367**:1731–1741.
 20. Iversen AC, van Staden L, Hacker Hughes J *et al.* The prevalence of common mental disorders and PTSD in the UK military: Using data from a clinical interview-based study. *Biomed Central* 2009. <http://biomedcentral.com/1471-244X/9/68> (11 February 2011, date last accessed).
 21. Hahn VC, Binnewies C, Sonnentag S, Mojza EJ. Learning how to recover from job stress: effects of a recovery training program on recovery, recovery-related self-efficacy, and well-being. *J Occup Health Psychol* 2011;**16**:202–216.
 22. Caldwell LL. Leisure and health: why is leisure therapeutic? *Br J Guid Counsel* 2005;**33**:7–26.
 23. Kawachi I, Berkman LF. Social ties and mental health. *J Urban Health* 2001;**78**:458–467.
 24. Etzion D, Eden D, Lapidot Y. Relief from job stressors and burnout: reserve service as a respite. *J Appl Psychol* 1998;**83**:577–585.
 25. Fritz C, Sonnentag S. Recovery, health, and job performance: effects of weekend experiences. *J Occup Health Psychol* 2005;**10**:187–199.
 26. Binnewies C, Sonnentag S, Mojza EJ. Feeling recovered and thinking about the good sides of one's work. *J Occup Health Psychol* 2009;**14**:243–256.