

Rewarding and unrewarding aspects of deployment to Iraq and its association with psychological health in UK military personnel

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Abstract

Purpose Research into how individuals perceive their deployment experiences is important for understanding the association between stressful events and subsequent positive or negative effects. This study examines perceptions among UK military personnel with regard to rewarding and unrewarding aspects of deployment in Iraq.

Methods Analyses were carried out on 5,573 UK military personnel who had deployed to Iraq between 2003 and 2006. Information on socio-demographic and military characteristics; deployment experiences, including perceptions of rewarding and unrewarding aspects of Service; and information on current health, were collected with questionnaires. Associations between deployment and health factors, and participants' perceptions of Service were examined.

Results The rewarding aspects of deployment were related to military tasks such as “doing the job you were trained to do”, “teamwork/comradeship” and altruistic aspects such as “helping local people”. The unrewarding aspects were “being separated from family and friends” and “quality of supply and equipment”. Although there was general agreement on the aspects that mattered to most

Service personnel, there were differences associated with operation deployed to, enlistment type, rank, Service and psychological health. Those with a psychological problem were more likely to find most military aspects of deployment unrewarding but were more likely to find helping the local population and working with other coalition forces rewarding.

Conclusions This study demonstrates how the perceptions of deployment, in terms of rewarding and unrewarding aspects, are shaped by Service characteristics, mental health and operation deployed to.

Keywords Military · Armed forces · Perceptions · Appraisals · Deployment

Introduction

Combat exposures have been linked with adverse health outcomes following military deployment (e.g. post-traumatic stress disorder (PTSD) and depression; Hoge et al. 2006; Smith et al. 2007), but they are also associated with greater perceived positive effects such as personal growth and increased resilience (Elder and Clipp 1989; Schok et al. 2008). Research on the impact of military trauma suggests that positive and negative effects from stressful events are separate constructs that are largely independent from each other (Britt et al. 2007; Fontana and Rosenheck 1998). Research on positive and negative appraisals of military service and deployment indicates that part of the association between traumatic experiences and PTSD is mediated through these appraisals (Fontana and Rosenheck 1998; Spiro et al. 1997). Recent research has suggested that psychological benefits may follow from the experience of stressful events and include but are not limited to: improved

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coping skills, increased self-confidence, improved military qualifications, monetary gain and increased personal experience. These phenomena have often been positively labelled as maturity, adversarial growth, flourishing, heightened existential awareness, post-traumatic growth, and thriving (Bauer and McAdams 2004a, b; Linley and Joseph 2004; Tennen and Affleck 2002).

Research into how individuals perceive their deployment experiences is an important means of understanding the association between stressful events and subsequent positive or negative effects (Schok et al. 2008). Research on peacekeeping soldiers has shown that differences in their perceptions of the peacekeeping mission, in terms of how meaningful it was to them, were associated with subsequent positive effects derived from the experience (Britt et al. 2001). Research into the perceptions of military deployment on a peacekeeping mission showed that 47% of individuals reported both positive and negative consequences, and a substantial majority reported at least some positive consequences, while a small percentage reported only negative consequences (Newby et al. 2005). Rewarding perceptions of the deployment included helping the local population, earning additional income and self-improvement. Unrewarding perceptions included being disappointed with the chain of command, lack of meaning for the mission, and being away from family.

We have previously reported general risk factors for PTSD in UK Armed Forces personnel (Iversen et al. 2008; Rona et al. 2009). This paper examines perceptions among UK Armed Forces personnel with regard to rewarding and unrewarding aspects of Service on deployment in Iraq. We hypothesise that aspects of deployment experiences such as working with equipment, doing a job that personnel were trained to do, engaging in combat, helping local people, comradeship, quality of leadership, separation from family, and quality of food differ between personnel with regard to socio-demographic, deployment and military factors (Browne et al. 2007; MHAT-V 2008). We also hypothesise that those with symptoms compatible with common mental health problems and PTSD have a different pattern of rewarding and unrewarding perceptions of deployment in comparison with those who do not present these symptoms (Ahronson and Cameron 2007; Bartone 2005).

Methodology

The cohort included 5,869 UK military personnel who had deployed to Iraq since 2003 on operation TELIC (TELIC is the UK military codename for operations in Iraq) and who participated in the first phase of the King's Centre for Military Health Research (KCMHR) military health study (Hotopf et al. 2006). The cohort comprised a random

sample of participants stratified by Service, enlistment type (regular or reserve personnel), and deployment status (personnel who deployed on TELIC 1 or personnel serving but who did not deploy at that time). Reserve personnel were over-sampled by a ratio of 2:1. The response rate, adjusted for those individuals who never received a questionnaire, was 61% (unadjusted response rate 59%). Analysis of non-responders showed that age, rank, gender, ethnic group, and enlistment type differed between responders and non-responders, but there were no differences in fitness to deploy (Tate et al. 2007). Weighting for non-response had little effect on the relative risks, which indicates that bias was small.

TELIC 1 refers to the first phase of the Iraq War, between 18th January and 28th April 2003, subsequent UK operations are called TELIC 2, TELIC 3, up to TELIC 14 in March 2009. In brief, TELIC 1 covers the war-fighting period and the invasion of Iraq, TELIC 2 the start of the occupation, and TELIC 3 onwards the increased importance of counter-insurgency operations as the security situation deteriorated. This study includes personnel who deployed on TELIC 1 ($n = 4,722$) and those who deployed on TELIC 2 to TELIC 6 ($n = 1,147$). Participants who did not complete the section on the perceptions of Service were excluded from the analyses ($n = 296$), analyses were carried out on 5,573 participants.

The socio-demographic, Service characteristics and health outcomes for the TELIC deployed sample have been described previously (Hotopf et al. 2006). Briefly, those who deployed on TELIC were mainly male (91.7%, $n = 5,071$) with an average age of 32.2 years. The majority of the sample were married (75.6%, $n = 4,193$), regular personnel (83.7%, $n = 4,665$), who served in the Army (67.8%, $n = 3,777$) and had a combat service support role (60.8%, $n = 3,465$) on deployment, as opposed to a combat (27.8%, $n = 1,479$) or a combat support role (11.5%, $n = 611$). There was a low prevalence of PTSD (4.2%, $n = 240$). We have previously reported on a differential effect of deployment on PTSD between regular and reserve personnel (Browne et al. 2007). Symptoms of common mental illness had a prevalence of (19.8%, $n = 1,122$).

The study was approved by the Ministry of Defence (Royal Navy) personnel research ethics committee and the King's College Hospital local research ethics committee.

Measures

Participants were asked to complete self-report questionnaires, which included information on socio-demographic and military characteristics, deployment experiences, and current health. Information about experiences on deployment included participants' role on deployment and questions regarding participants' perceptions of Service.

Questionnaires were completed at an average of 18 months following personnel's return from deployment.

Rewarding and unrewarding perceptions of service

Information on perceptions of military service in Iraq was obtained through a series of 20 questions about the aspects of deployment personnel felt were rewarding and unrewarding (described in Table 1). Each item could be answered as most rewarding (rewarding aspects), least rewarding (unrewarding aspects) or neither, and participants were asked to select up to three items each for most and least rewarding aspects of Service. For participants who specified more than three aspects of either most or least rewarding ($n = 780$), we randomly selected three aspects to include in the analyses.

There were 15 questions that were answered by the entire sample, two questions that pertained to personnel serving on operation TELIC 1, one question that pertained to regular personnel, and two questions that were asked of reserve personnel only. There was a large variation in the percentage of characteristics endorsed by participants from 0.4 to 69.3% for rewarding aspects and from 1.2 to 67.8%

for unrewarding aspects. Questions that were endorsed by 10% or more of the whole sample were selected for further analyses.

Health outcomes

Measures of health included the National Center for PTSD Checklist (PCL) (Weathers et al. 1994), which is a 17-item self-report measure of the 17 DSM-IV symptoms of PTSD, with a total score ranging from 17 to 85; and the 12-item General Health Questionnaire (GHQ-12) (Goldberg and Williams 1988) was used to measure symptoms of common mental illness. The GHQ-12 has a total score ranging from 0 to 36. The recommended cut-off values were used, with a score of 50 or greater on the PCL-C, and a score of 4 or greater on the GHQ-12.

Analyses

All analyses were carried out in STATA 10 (Stata Corporation, College Station, TX, USA). Frequencies and prevalences were calculated to describe the variables assessing rewarding and unrewarding aspects of Service. Prevalences

Table 1 Perceptions of service, measured as the rewarding and unrewarding aspects, frequencies (n) and prevalences (%)

| Variable | Rewarding, n (%) | Unrewarding, n (%) |
|--|-----------------------|-------------------------|
| Questions related to whole sample | | |
| Quality of leadership of senior chain of command ^a | 351 (7.1) | 1,006 (19.4) |
| Working with equipment under operational conditions ^a | 1,860 (36.2) | 253 (5.1) |
| Engaging in combat ^a | 727 (14.8) | 154 (3.1) |
| Not being in barracks ^a | 445 (9.2) | 224 (4.5) |
| Helping the local people ^a | 1,678 (32.2) | 162 (3.4) |
| Teamwork/comradeship ^a | 3,004 (57.9) | 64 (1.2) |
| Being separated from family and friends ^a | 31 (0.6) | 3,516 (67.8) |
| Doing the job trained to do ^a | 3,573 (69.3) | 89 (1.8) |
| Quality of leadership of immediate commanders ^a | 478 (9.7) | 592 (11.2) |
| Working with coalition forces ^a | 700 (14.1) | 287 (6.0) |
| Quality of food ^a | 344 (7.0) | 1,721 (33.9) |
| Boredom ^a | 23 (0.5) | 1,634 (31.5) |
| Quality of supply and equipment ^a | 107 (2.2) | 2,279 (44.2) |
| Media coverage of the war ^a | 124 (2.6) | 1,053 (20.9) |
| Physical conditions in theatre ^a | 151 (2.9) | 1,749 (33.7) |
| Questions related to TELIC 1 deployed personnel | | |
| Getting rid of saddam ^a | 927 (22.1) | 136 (3.5) |
| Embedded journalists ^a | 17 (0.4) | 430 (10.9) |
| Questions related to regulars | | |
| Working with other UK military units | 615 (14.3) | 80 (1.9) |
| Questions related to reserves | | |
| Working alongside regular armed forces | 195 (23.0) | 41 (4.9) |
| Being in full-time military service | 206 (24.2) | 18 (2.1) |

^a Weighted to account for sampling fractions

Table 2 Intermediate and large effect sizes for outcomes with high and low prevalence

| | Low prevalence (24% or below) | | High prevalence (25% or above) | |
|---------------------|-------------------------------|-------------------|--------------------------------|-------------------|
| | Intermediate effect size | Large effect size | Intermediate effect size | Large effect size |
| Pair of prevalences | 10 vs. 20% | 10 vs. 40% | 40 vs. 50% | 40 vs. 70% |
| Risk ratio | 2.00 | 4.00 | 1.25 | 1.75 |
| Inverse risk ratio | 0.50 | 0.25 | 0.80 | 0.57 |

were reported for the comparisons of Service-related factors and health outcomes for each variable measuring rewarding and unrewarding aspects of Service. Adjusted risk ratios (ARR), were calculated with Poisson regressions with robust error variance to control for socio-demographic factors (Barros and Hirakata 2003). Where unstratified analyses are presented, we accounted for sampling fractions with the ‘pweight’ command.

The associations between deployment factors and perceptions of Service were examined together with one model for each Service aspect. We additionally controlled for differences in Service, age, sex, level of education, marital status, parental status, medical downgrading and role on deployment. The associations between health outcomes and Service perceptions were examined with separate analyses for symptoms of PTSD and common mental illness; models controlled for deployment factors as well as socio-demographic characteristics.

The relation between the difference in a pair of prevalences and the associated RR is not invariant of the size of the prevalence. With the difference in the pair of prevalences held constant, smaller prevalences are associated with larger odds ratios (Fleiss et al. 1986) and also RRs. RRs are usually used in disease outcomes that have a low prevalence. However, in this study, we have included outcomes that are common (between 11 and 64%). We have calculated benchmarks for RR that indicate moderate and strong associations for pairs of prevalences in common outcomes (Table 2).

Based on an RR of 4 and a prevalence (p) of 10%, we calculated the corresponding RR for a large effect size with the same difference in the pair of prevalences and $p = 40\%$. We repeated these calculations with an RR of 2 ($p = 10\%$) to obtain the equivalent RR with $p = 40\%$ as an estimate of intermediate effect size. For these calculations, a difference of 30% corresponds to a strong effect size, and a difference of 10% corresponds to a moderate effect size. Thus, in the interpretation of effect sizes for outcomes with a prevalence of 25% or over, a strong effect size is an RR of 1.75 or above (inverse 0.57 or less) and intermediate effect size is an RR of 1.25–1.74 (inverse RR) = 0.8–0.58. For outcomes with a prevalence near 10%, a strong effect size is an RR of 4 or above (inverse RR = 0.25 or less), and intermediate effect size is an RR of 2–3.9 (inverse RR 0.5–0.26).

Results

The rewarding aspects of deployment were “doing the job [they were] trained to do”, “working with equipment under operational conditions”, “teamwork and comradeship” and “helping local people”. The unrewarding aspects were “being separated from family and friends”, “quality of supply and equipment”, “boredom”, “quality of food” and “physical conditions of theatre”; and to a lesser extent “quality of senior leadership” and the “quality of immediate commanders”.

Deployment factors

Associations between deployment factors, health outcomes and rewarding and unrewarding aspects of Service, asked of the whole sample, are displayed in Tables 3 and 4. Those who participated in TELIC 2 or later were less likely to endorse as rewarding “engaging in combat”, “helping local people” and “doing the job [they were] trained to do”, and more likely to endorse as rewarding “working with coalition forces”, the effect sizes of the associations were weak (Table 3). “Separation from family”, “boredom” and “physical conditions in theatre” were more of a problem in TELIC 2 or later, but “quality of food” and “quality of equipment” were less likely to be perceived as unrewarding, effect sizes were weak to moderate (Table 4).

Compared to regular personnel, reserve personnel or reservists were less likely to endorse “teamwork/comradeship” and “doing the job [they were] trained to do” as rewarding aspects of Service; both associations were weak (Table 3). Reservists were also more likely to perceive “boredom” and the “immediate leadership” as unrewarding but less likely to perceive the “media coverage of the war” as unrewarding compared to regular personnel; associations were moderate to weak (Table 4). There were few significant associations between rewarding aspects of Service and rank, but officers were less likely than the junior ranks to endorse “working with equipment” during deployment as a rewarding aspect of Service, and more likely to perceive “engaging in combat” as rewarding. Non-commissioned officers were less likely than the junior ranks to endorse “working with Coalition Forces” as rewarding (Table 3). Both officers and non-commissioned officers were more

Table 3 Rewarding aspects of service, weighted prevalence (%), weighted adjusted risk ratios (ARR) and 95% confidence intervals (CI)

| Variable | <i>n</i> | Working with equipment | Engaging in combat | Helping local people | Teamwork/comradeship | Doing the job trained to do | Working with coalition forces |
|------------------------------------|----------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|
| | | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) |
| Deployment | | | | | | | |
| TELIC 1* | 4,523 | 36.6 | 15.5 | 32.9 | 57.5 | 70.3 | 12.9 |
| TELIC 2 or later | 1,050 | 34.6, 0.95 (0.85–1.05) | 11.9, 0.64 (0.53–0.77) | 29.3, 0.83 (0.74–0.94) | 59.7, 1.05 (0.98–1.12) | 65.3, 0.92 (0.87–0.97) | 18.9, 1.46 (1.24–1.72) |
| Enlistment type^b | | | | | | | |
| Regulars* | 4,665 | 36.4 | 15.5 | 31.6 | 58.2 | 70.4 | 14.5 |
| Reserves | 908 | 34.0, 0.93 (0.81–1.07) | 8.3, 0.98 (0.76–1.26) | 35.9, 1.09 (0.96–1.24) | 54.8, 0.87 (0.79–0.95) | 58.5, 0.84 (0.77–0.90) | 9.5, 0.83 (0.61–1.12) |
| Rank | | | | | | | |
| Other* | 1,075 | 36.5 | 18.3 | 33.8 | 54.5 | 66.3 | 17.6 |
| Non-commissioned officer | 3,496 | 37.5, 0.99 (0.88–1.12) | 14.1, 1.05 (0.89–1.24) | 32.2, 0.96 (0.85–1.08) | 57.3, 0.99 (0.91–1.07) | 69.5, 1.05 (0.99–1.11) | 12.8, 0.81 (0.66–1.00) |
| Officer | 961 | 31.2, 0.72 (0.60–0.86) | 14.0, 1.44 (1.09–1.90) | 29.8, 1.06 (0.87–1.28) | 64.0, 1.02 (0.92–1.14) | 71.7, 1.05 (0.96–1.14) | 15.1, 1.11 (0.81–1.51) |
| Service | | | | | | | |
| Army* | 3,777 | 36.5 | 17.1 | 38.5 | 56.3 | 68.5 | 11.7 |
| Royal air force | 1,029 | 36.9, 1.00 (0.90–1.11) | 3.6, 0.41 (0.29–0.59) | 16.5, 0.46 (0.39–0.54) | 65.5, 1.10 (1.03–1.17) | 70.8, 1.03 (0.98–1.09) | 23.1, 1.93 (1.62–2.30) |
| Royal navy | 492 | 34.8, 0.99 (0.86–1.14) | 9.0, 0.56 (0.41–0.77) | 19.0, 0.49 (0.40–0.60) | 53.4, 0.91 (0.82–1.00) | 68.7, 0.99 (0.92–1.06) | 15.5, 1.36 (1.07–1.73) |
| Royal marines | 275 | 31.7, 0.86 (0.71–1.04) | 40.7, 1.32 (1.13–1.56) | 37.0, 0.99 (0.83–1.18) | 56.7, 1.03 (0.91–1.16) | 75.9, 1.07 (0.99–1.16) | 5.5, 0.50 (0.29–0.87) |
| PCL-C | | | | | | | |
| Non-case* | 5,258 | 36.3 | 14.4 | 31.5 | 58.5 | 69.8 | 13.8 |
| Case | 240 | 34.8, 0.95 (0.77–1.17) | 22.9, 1.15 (0.89–1.49) | 49.7, 1.42 (1.21–1.65) | 42.9, 0.78 (0.65–0.92) | 60.8, 0.90 (0.80–1.00) | 20.6, 1.78 (1.32–2.40) |
| GHQ-12 | | | | | | | |
| Non-case* | 4,396 | 36.8 | 14.3 | 30.6 | 59.6 | 70.5 | 13.7 |
| Case | 1,122 | 34.0, 0.93 (0.84–1.03) | 15.8, 1.14 (0.97–1.33) | 38.7, 1.25 (1.14–1.38) | 51.3, 0.87 (0.81–0.94) | 65.4, 0.93 (0.88–0.98) | 15.6, 1.23 (1.03–1.46) |

* Baseline category

^a Adjusted for theatre of deployment, enlistment type (regular or reserve), service, rank, age, sex, level of education, marital status, parental status, medical downgrading (being fit for operational deployment) and role on deployment (combat, combat support, combat services support)

^b Non-weighted prevalences and ARRs

Table 4 Unrewarding aspects of service, weighted prevalence (%), weighted adjusted risk ratios (ARR) and 95% confidence intervals (CI)

| Variable | <i>n</i> | Quality of senior leadership | Quality of immediate leadership | Separated from family/friends | Quality of food | Boredom | Quality/supply of equipment | Media coverage of the war | Physical conditions in theatre |
|------------------------------|----------|------------------------------|---------------------------------|-------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|--------------------------------|
| | | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) | %, ARR ^a (95% CI) |
| Deployment | | | | | | | | | |
| TELIC 1* | 4,523 | 19.1 | 11.5 | 66.4 | 37.1 | 29.4 | 47.0 | 21.0 | 32.5 |
| TELIC 2 or later | 1,050 | 21.0, 1.13 (0.97–1.32) | 10.0, 0.95 (0.76–1.20) | 73.9, 1.11 (1.06–1.16) | 20.3, 0.50 (0.44–0.58) | 40.2, 1.40 (1.27–1.55) | 32.6, 0.67 (0.61–0.75) | 20.5, 0.99 (0.85–1.15) | 38.5, 1.14 (1.04–1.26) |
| Enlistment type ^b | | | | | | | | | |
| Regulars* | 4,665 | 19.1 | 10.6 | 68.3 | 34.5 | 31.3 | 44.3 | 21.3 | 33.5 |
| Reserves | 908 | 22.8, 1.18 (0.97–1.44) | 17.1, 1.62 (1.27–2.06) | 63.3, 0.99 (0.92–1.06) | 27.2, 1.01 (0.88–1.16) | 33.2, 1.38 (1.20–1.59) | 42.2, 0.90 (0.81–1.01) | 16.8, 0.69 (0.55–0.86) | 35.9, 1.01 (0.88–1.15) |
| Rank | | | | | | | | | |
| Other* | 1075 | 20.9 | 9.0 | 65.0 | 44.6 | 42.0 | 35.2 | 20.8 | 34.4 |
| Non-Commissioned Officer | 3,496 | 20.1, 0.95 (0.79–1.14) | 11.4, 1.09 (0.83–1.43) | 69.0, 0.98 (0.92–1.04) | 35.3, 0.91 (0.83–1.01) | 30.9, 0.93 (0.83–1.04) | 46.0, 1.20 (1.07–1.34) | 19.9, 0.98 (0.82–1.17) | 34.6, 0.94 (0.83–1.06) |
| Officer | 961 | 15.5, 0.66 (0.50–0.87) | 12.3, 0.90 (0.61–1.33) | 66.8, 1.01 (0.92–1.10) | 17.0, 0.58 (0.47–0.71) | 22.5, 0.68 (0.56–0.83) | 47.9, 1.32 (1.14–1.53) | 24.8, 1.17 (0.91–1.50) | 29.7, 0.77 (0.63–0.93) |
| Service | | | | | | | | | |
| Army* | 3777 | 15.7 | 10.2 | 67.1 | 39.0 | 25.8 | 46.3 | 19.3 | 37.4 |
| Royal air force | 1029 | 23.7, 1.26 (1.07–1.48) | 15.3, 1.30 (1.03–1.62) | 71.8, 1.08 (1.02–1.14) | 18.0, 0.57 (0.49–0.66) | 27.3, 1.11 (0.97–1.25) | 45.1, 0.94 (0.86–1.03) | 21.3, 1.15 (0.98–1.35) | 29.7, 0.77 (0.68–0.87) |
| Royal navy | 492 | 16.5, 0.91 (0.73–1.15) | 11.4, 1.09 (0.82–1.45) | 70.8, 1.07 (1.00–1.14) | 22.0, 0.58 (0.49–0.69) | 39.3, 1.71 (1.53–1.92) | 28.3, 0.59 (0.51–0.69) | 30.7, 1.52 (1.29–1.79) | 22.2, 0.61 (0.51–0.73) |
| Royal marines | 275 | 16.9, 0.95 (0.70–1.29) | 7.0, 0.80 (0.49–1.31) | 56.8, 0.85 (0.76–0.96) | 51.5, 1.07 (0.94–1.22) | 26.0, 0.96 (0.77–1.19) | 41.9, 0.88 (0.75–1.03) | 22.3, 1.04 (0.81–1.35) | 22.6, 0.67 (0.53–0.85) |
| PCL-C | | | | | | | | | |
| Non-case* | 5,258 | 18.9 | 11.0 | 68.2 | 33.7 | 31.5 | 44.1 | 20.9 | 33.7 |
| Case | 240 | 32.8, 1.78 (1.41–2.24) | 19.7, 2.05 (1.49–2.81) | 63.1, 0.96 (0.85–1.08) | 40.4, 0.93 (0.79–1.10) | 31.3, 0.89 (0.70–1.13) | 46.6, 1.12 (0.95–1.31) | 21.4, 1.06 (0.79–1.42) | 35.1, 1.01 (0.82–1.25) |
| GHQ-12 | | | | | | | | | |
| Non-case* | 4,396 | 17.9 | 10.3 | 68.1 | 33.7 | 32.0 | 43.6 | 20.3 | 34.1 |
| Case | 1,122 | 25.7, 1.46 (1.27–1.67) | 15.1, 1.59 (1.32–1.92) | 67.3, 1.00 (0.95–1.05) | 34.9, 0.97 (0.88–1.07) | 29.0, 0.88 (0.78–0.99) | 46.6, 1.10 (1.02–1.19) | 23.3, 1.11 (0.97–1.28) | 32.9, 0.94 (0.85–1.05) |

* Baseline category

^a Adjusted for theatre of deployment, enlistment type (regular or reserve), service, rank, age, sex, level of education, marital status, parental status, medical downgrading (being fit for operational deployment) and role on deployment (combat, combat support, combat services support)^b Non-weighted prevalences and ARRs

likely than the junior ranks to endorse “quality and supply of equipment” as an unrewarding aspect of Service. Officers were also less likely to perceive the “quality of the senior leadership”, the “quality of food”, “boredom” and the “physical conditions in theatre” as unrewarding compared to the junior ranks, the effect sizes being weak to moderate (Table 4).

Personnel across the Services differed in their perceptions of several aspects of Service in Iraq, which probably reflected differences in the tasks between the Services. However, for some differences in perceptions, it was not clear whether they reflected differences in tasks; compared to the Army, personnel in the RAF were more likely and Royal Navy personnel were less likely to perceive “teamwork/comradeship” as rewarding, but associations were weak (Table 3). There were also associations between serving in the RAF or the Royal Navy compared to the Army, and perceiving “collaboration with other Coalition Forces” as rewarding. There were weak associations between serving in the RAF, compared to the Army, and endorsing the “quality of the senior leadership” and the “immediate leadership” as unrewarding (Table 4). There were weak associations between serving in the RAF or the Royal Navy and endorsing “being away from family or friends” as unrewarding. Personnel in the Royal Navy were less likely than Army personnel to endorse “the quality and supply of equipment” as an unrewarding aspect of Service but were more likely to find the “media coverage of the war” unrewarding, associations were moderate (Table 4).

Health outcomes

Personnel with symptoms of PTSD or with common mental health problems were more likely to perceive “helping the local people” and “working with Coalition Forces” as rewarding aspects of Service (Table 3). There were negative associations between the symptoms of PTSD or common mental illness and perceiving “teamwork or comradeship” and “doing the job trained to do” as rewarding, associations were moderate to weak.

Personnel with symptoms of PTSD and common mental health problems were more likely to endorse the “quality of the senior leadership” and the “quality of immediate commanders” as unrewarding compared to personnel without such symptoms, associations with the symptoms of PTSD were moderate to large (Table 4).

There was a weak effect for personnel with symptoms of common mental health problems to find “the quality and supply of equipment” unrewarding, and a weak negative association with finding “boredom” unrewarding (Table 4).

Perceptions of service aspects in specific military groups (TELIC 1 deployed personnel, regulars, reserves)

Reservists who served on later TELIC operations were more likely than their counterparts who served on Op TELIC 1 to perceive being in full-time Service as rewarding (ARR = 1.87, 95% CI 1.14–3.06); and reservists who served in the Royal Navy were more likely to find it rewarding compared to reserve personnel who served in the Army (ARR = 1.61, 95% CI 1.03–2.53). There was also an association between Royal Navy reservists and endorsing working with the regular Armed Forces as rewarding (ARR = 2.14, 95% CI 1.37–3.33).

Personnel who served in the Royal Navy and deployed on TELIC 1 were more likely than Army personnel to endorse “getting rid of Saddam” as a rewarding aspect of Service (ARR = 1.50, 95% CI 1.26–1.78). In contrast, officers who deployed on TELIC 1 were less likely to perceive “getting rid of Saddam” as rewarding (ARR = 0.73, 95% CI 0.54–0.98). There was also a weak association between personnel who developed general symptoms of mental illness following deployment on TELIC 1 and perceiving ‘getting rid of Saddam’ as rewarding (ARR = 1.15, 95% CI 1.00–1.33).

The presence of embedded journalists was more likely to be endorsed as unrewarding by regulars than reserves (ARR = 0.37, 95% CI 0.24–0.56); personnel who served in the Army compared to the RAF (ARR = 0.68, 95% CI 0.50–0.93); and personnel who served in the Royal Marines compared to the Army (ARR = 1.60, 95% CI 1.17–2.18).

Discussion

The main findings of our study were as follows: first, that the rewarding aspects of deployment were issues related to military tasks such as “doing the job trained to do” and “working with equipment under operational conditions”, “teamwork and comradeship” and altruistic aspects such as “helping local people”. The unrewarding aspects were “being separated from family and friends”, issues related to military such as the “quality of supply and equipment” and to a lesser extent the “quality of senior leadership” and “quality of immediate commanders”; other unrewarding aspects included “boredom”, “quality of food” and the “physical conditions of theatre”. Second, although there was general agreement on which issues were most important to Service personnel, there were differences associated with operation deployed to, enlistment type, rank, Service and psychological health.

Military aspects and rewarding and unrewarding perceptions of deployment

There are several features that deserve discussion such as changes in the perception of rewarding and unrewarding aspects with the operation deployed to, perceptions according to rank, enlistment type, and Service.

Changes between TELIC 1 and later TELIC operations

Factors that motivated service personnel changed between the period of TELIC 1 and later TELIC operations. Some of the factors appear to have changed as a result of organisational adjustments, such as the improvement of catering facilities and quality and supply of equipment. This may reflect the fact that the UK Ministry of Defence (MOD) was responsive to the criticisms of these issues that were aired by the media at the beginning of the Iraq War (BBC News 2003a, b). However, other issues became more relevant in the later stages of deployment, such as boredom and separation from family and friends. It is possible that some Service personnel became more disenchanted with the nature of their role during the Iraq occupation. Changes in perceptions related to later deployments may reflect an increased hostility from civilians and attack from paramilitary groups. Perceptions of combat and helping the local people as unrewarding aspects of Service may also reflect a change in the tasks on later deployments, such that personnel engaged less in these activities.

Boredom may be an important aspect to consider. It is recognised that periods of boredom among Service personnel, while restricted to a physical space, barracks or ships, is part and parcel of being in the military. Our study demonstrated that boredom is especially common in reservists, lower ranks and personnel serving in the Royal Navy. A purposeful programme to decrease levels of boredom may have benefits if tailored to the groups that are most affected. From a managerial stand point, boredom has been recognised as an important feature of military deployment (Harris and Segal 1985; Resteigne and Soeters 2009). The provision of constructive instead of meaningless activities, creating time for privacy and providing an environment for good relations within the unit, has been proposed as possible managerial tools for tackling boredom.

Reservists

The dissatisfaction with leadership and lower level of comradeship in reserve personnel compared to regulars fit with previous research on this cohort (Browne et al. 2007), and are consistent with the increased risk of PTSD in reserve

personnel (Hotopf et al. 2006; Milliken et al. 2007; Vogt et al. 2008). Reserve personnel were also less likely than regular personnel to perceive doing the job one was trained for as a rewarding aspect of Service, and were more likely to perceive boredom as an unrewarding aspect of Service. These differences are consistent with previous concerns among reserve personnel regarding discrimination and differential treatment from the regular forces. However, research suggests that these issues have improved, and a review of perceptions among reserves who deployed on Op TELIC 5 reported that reserve personnel had encountered fewer problems in their military role in theatre (Dandeker et al. 2010). Furthermore, after the initial war-fighting phase, reservists and regulars were used in similar ways on deployment, and changes within the UK Armed Forces to improve conditions for reservists include the introduction of a bespoke Reservists Mental Health Assessment Programme; a minimum of 21 days notice of mobilisation; and support for families (House of Commons Defence Committee 2004; Directorate of Reserve Forces and Cadets 2005). There has also been a cultural change among the UK Armed Forces, with an emphasis on regular and reserve forces working together. This is exemplified by the change to Army recruitment with the “One Army” recruiting campaign (Sweeney 2007). Improvements to Service conditions for reserves following these cultural and policy changes are supported by the finding that reserves who served on later TELIC operations were more likely than those who served on TELIC 1 to perceive being in full-time Service as rewarding.

Ranks

We found that officers were generally less likely than enlisted personnel to endorse unrewarding aspects of Service, such as concerns about leadership, the quality of food and being bored. An exception was the perceptions of the quality and supply of equipment; officers were both less likely to endorse equipment as a rewarding aspect of Service and more likely to view the quality of equipment as unrewarding. It is possible that officers have a greater concern about the quality of equipment as a consequence of their responsibilities to their personnel. The differences in the views of boredom, quality of food, physical conditions in theatre and leadership between officers and personnel of enlisted ranks fit with the role of officers to lead-by-example. It is also likely that greater experience and level of training among officers would influence their perceptions of conditions on deployment. Accommodation and messing are of the same standard for officers and lower ranks in the deployed situation, so these differences reflect attitude rather than real differences in standards.

Service differences

Differences in the appraisals of deployments between the Services largely correspond to their differences in tasks. For example, the Army and Royal Marines engaged and supported combat, helped the locals and experienced more intensely physical conditions in theatre. The Royal Navy and the RAF undertook comparatively few combat missions, with the exception of the RAF helicopter units, and are less likely than Army and Royal Marines personnel to have contact with the local people. Royal Marines held similar perceptions to Army personnel but perceived engaging in combat as more rewarding. They were less concerned about being separated from friends and family and the physical conditions in theatre. The Royal Marines deployed on TELIC 1 had their own operation in the war-fighting phase, at the end of which they were withdrawn. This probably influenced the Royal Marines perceptions of combat. However, perceptions of quality of leadership also differed between the Services, and personnel in the RAF were more likely than Army personnel to perceive both senior and immediate leadership as unrewarding aspects of Service. It is not clear why this difference should occur, but discontent with leaders may reflect differences in perceptions of how meaningful the work is (Britt et al. 2007).

Mental health and perception of rewarding and unrewarding aspects of deployment

Those with common mental illness and PTSD symptoms were more likely to perceive the senior and immediate leadership as unrewarding, and were less likely to perceive aspects of teamwork and comradeship as rewarding. This is to be expected as social withdrawal is a characteristic of common mental illness and PTSD (American Psychiatric Association [DSM-IV] 1994; Hofmann et al. 2003; Sloman et al. 2003). Nonetheless, this is an important finding because the literature on unit cohesion in military personnel has shown it to be associated with individual resilience and adaptive coping with traumatic experiences (Brailey et al. 2007; Whealin et al. 2007). Lack of social support on the other hand is predictive of mental health problems independently of combat exposure (Campbell et al. 2007; Dikel et al. 2005; Fontana and Rosenheck 1994; Iversen et al. 2008; Rona et al. 2009). Lower appraisals of teamwork and comradeship and greater discontent with the leadership among personnel with symptoms of PTSD and depression are consistent with previous research on the association between perceptions and the impact of military traumatic experiences (Fontana and Rosenheck 1998). Furthermore, alienation from others has been shown to mediate the association

between traumatic experiences and PTSD (Fontana and Rosenheck 1998).

Symptoms of mental illness following return from deployment were associated with greater perceived reward from helping local people and collaborating with other coalition forces. This is counterintuitive given that research suggests that inability to find meaning in traumatic experiences is associated with negative psychological adjustment (Britt et al. 2007; Schok et al. 2008). However, it is possible that, at least in this study, personnel with symptoms of mental illness direct their discontent towards the Armed Forces, and therefore perceive helping the local people and working with personnel from the other Coalition Forces as relatively rewarding aspects of Service.

Strength and limitations

This study was based on a large random sample representative of the UK Armed Forces and had a satisfactory response rate (61%) in comparison with studies of the same nature, as young males of low socio-economic background, which are an important component of the UK Armed Forces, are notoriously reluctant to complete questionnaires (Chretien et al. 2007). The cross-sectional design of this study is appropriate to assess how characteristics at the time shaped the perceptions of rewarding and unrewarding aspects of deployment. Most of the characteristics we have examined are unlikely to change (Service, enlistment type and operation deployed to); therefore, a longitudinal design would not add much to our results. Symptoms of mental disorders following return from deployment is an exception. It is possible that the perceptions of leaders and colleagues as unrewarding aspects of deployment, among personnel with symptoms of PTSD and common mental illness, reflect current concerns rather than perceptions during deployment.

A large number of associations were examined in this study, which may introduce statistical error, in terms of false positives. However, rather than relying on an alpha level for significance, we created a method to assess associations according to the size of the effect, and small effect sizes should be regarded with caution.

Another issue is that the time of questionnaire completion averaged around 18 months following personnel's return from deployment, and appraisals of service on deployment may be modified by later experiences. Research has shown that there is a bias for the recollection of past experiences as more positive (Walker et al. 2003). However, given that participants were asked to select three rewarding and three unrewarding aspects of Service, it seems unlikely that appraisals would be biased by positive recollections.

Implications and conclusions

This study demonstrates how perceptions of deployment, in terms of rewarding and unrewarding experiences, are shaped by Service characteristics (Service and enlistment type), socio-economic status (rank), mental health (common mental illness and PTSD symptoms) and operation deployed to. The most common perceptions were shared by the total group, but within these, there were underlying patterns of differences that were shown by a large number of associations, the majority of them were of moderate effect size. Military personnel appeared less concerned about aspects that are related to organisational issues, such as quality and supply of equipment, in later deployments compared to in the initial stages of deployment. In contrast, concerns about aspects that impinge on the way Service personnel use their time meaningfully, such as boredom and perceiving that doing the job one was trained for is rewarding, became more relevant in the later stages of deployment. Knowledge of individuals' perceptions of their deployment experiences can improve our understanding of the deployment environment and may be useful for identifying potentially modifiable factors, such as leadership concerns and boredom, which are linked with occupational health.

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