

Battlemind Training for UK Armed Forces: A Cluster Randomised Controlled Trial

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ABSTRACT

Background: *Research among Armed Forces (AF) personnel has found that combat exposure can increase the risk of subsequent psychological ill-health. Psycho-educational interventions for personnel returning from deployment have been developed as one approach to try to mitigate the possible ill-effects of combat. One such intervention is Battlemind, which was developed by the US Army and was found to have a beneficial effect on mental health among those exposed to high levels of potentially traumatic combat events. The aim of this study was to evaluate the efficacy of Battlemind in UK AF.*

Methods: *Battlemind was compared with the UK standard stress and homecoming brief in a cluster randomised controlled trial. Participants were AF Personnel returning home from deployment in Afghanistan via a third location decompression facility in Cyprus. We recruited 2443 personnel who completed a baseline questionnaire about combat experiences and mental health before they received the brief. Of these, 1616 (66%) completed a follow-up questionnaire approximately 6 months later. Measures of mental health included the General Health Questionnaire (GHQ-12) which is a measure of common mental disorders, and the post traumatic stress disorder checklist (PCL-C). Alcohol misuse was measured with the Alcohol Use Disorders Identification Test (AUDIT) plus an additional question about binge drinking. A binge drinker was defined as someone who drinks 12 or more units on a single occasion weekly or daily/almost daily. Participants also completed feedback questions about the brief they had received.*

Differences in study outcomes between Battlemind and the standard brief were analyzed using mixed-effect models to take account of possible cluster effects.

Main Findings: *In the mixed effects model, we did not find a statistically significant difference between Battlemind and the standard brief in either symptoms of PTSD or GHQ-12 caseness. Overall AUDIT scores did not differ significantly between the two groups but became significant after adjusting for combat exposure (mean difference -0.75 (95% confidence interval -1.47 to -0.04), $P = 0.04$). Furthermore those who received Battlemind were less likely to be classified as binge drinkers than those in the standard brief (adjusted odds ratio 0.73 (95% confidence interval 0.58 – 0.92). Participants' ratings of the subjective utility of Battlemind and the standard brief did not differ.*

Conclusions: *An anglicised version of post-deployment Battlemind did not improve mental health compared with the standard post-deployment brief however it did have a modest impact on binge drinking. Alcohol misuse is recognised as a problem in UK AF personnel, therefore, a brief intervention such as Battlemind may offer a useful addition to post-deployment alcohol misuse prevention strategies.*

1.0 BACKGROUND

Post-deployment psychological support is widely implemented for military personnel in order to mitigate the potential ill-effects of combat on subsequent mental health. For instance, of 16 NATO and Partnership-for-Peace (PfP) nations who participated in a military leader's survey on occupational stress, 14 reported that some type of post-deployment psychological support was offered (Adler, Cawkill, van

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14. ABSTRACT

Background: Research among Armed Forces (AF) personnel has found that combat exposure can increase the risk of subsequent psychological ill-health. Psycho-educational interventions for personnel returning from deployment have been developed as one approach to try to mitigate the possible ill-effects of combat. One such intervention is Battlemind, which was developed by the US Army and was found to have a beneficial effect on mental health among those exposed to high levels of potentially traumatic combat events. The aim of this study was to evaluate the efficacy of Battlemind in UK AF. **Methods:** Battlemind was compared with the UK standard stress and homecoming brief in a cluster randomised controlled trial. Participants were AF Personnel returning home from deployment in Afghanistan via a third location decompression facility in Cyprus. We recruited 2443 personnel who completed a baseline questionnaire about combat experiences and mental health before they received the brief. Of these, 1616 (66%) completed a follow-up questionnaire approximately 6 months later. Measures of mental health included the General Health Questionnaire (GHQ-12) which is a measure of common mental disorders, and the post traumatic stress disorder checklist (PCL-C). Alcohol misuse was measured with the Alcohol Use Disorders Identification Test (AUDIT) plus an additional question about binge drinking. A binge drinker was defined as someone who drinks 12 or more units on a single occasion weekly or daily/almost daily. Participants also completed feedback questions about the brief they had received. Differences in study outcomes between Battlemind and the standard brief were analyzed using mixed-effect models to take account of possible cluster effects. **Main Findings:** In the mixed effects model, we did not find a statistically significant difference between Battlemind and the standard brief in either symptoms of PTSD or GHQ-12 caseness. Overall AUDIT scores did not differ significantly between the two groups but became significant after adjusting for combat exposure (mean difference -0.75 (95% confidence interval -1.47 to -0.04), P = 0.04). Furthermore those who received Battlemind were less likely to be classified as binge drinkers than those in the standard brief (adjusted odds ratio 0.73 (95% confidence interval 0.58 0.92). Participants ratings of the subjective utility of Battlemind and the standard brief did not differ. **Conclusions:** An anglicised version of post-deployment Battlemind did not improve mental health compared with the standard post-deployment brief however it did have a modest impact on binge drinking. Alcohol misuse is recognised as a problem in UK AF personnel, therefore, a brief intervention such as Battlemind may offer a useful addition to post-deployment alcohol misuse prevention strategies.

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den Berg *et al* 2008). This support varied considerably and could include individual interviews with military mental health professionals, homecoming briefs, debriefings, and decompression. Litz *et al* (2002) have commented that despite the frequent use of psychological support in the military in many countries, few studies have evaluated these interventions. Evaluation is especially pertinent given the generally disappointing results that have been obtained from studies that have evaluated single sessions of psychological debriefing for trauma more generally. Debriefing sessions encourage participants to go through detailed recollection and emotional processing of the traumatic event experienced. A Cochrane review (Rose *et al* 2002) and a meta-analysis (van Emmerik 2002) both concluded that such interventions were not beneficial and indeed in some cases harmful. It is noteworthy that these reviews each included only one study within a military population.

In 2000, the routine use of psychological debriefing in the UK AF was stopped on the basis of the evidence that had been emerging and that was subsequently confirmed in the reviews referred to above. For many years however, it has been UK AF policy to deliver a psycho-educational brief to personnel returning from deployment. Post-deployment briefings are considered appropriate to raise awareness of psychological injury following exposure to potentially traumatic events, they may assist others to detect evidence of psychological ill-health in personnel returning from operational deployments and may ease the stigma around psychological ill-health (Surgeon General Policy Letter 03/06). A survey of UK AF personnel found that those who reported receiving a homecoming brief had fewer symptoms of PTSD than those who had not received a brief, although this effect was no longer significant after adjusting for pre-deployment and deployment-related factors (Iversen *et al*, 2008). The current brief delivered to UK personnel returning from deployment consists of two parts: a brief about stress management, usually delivered by a military mental health practitioner, and a brief about the homecoming transition often delivered by a military chaplain or welfare officer. These briefs were standardized in 2008 but have not been evaluated in a randomised controlled trial.

The US Army developed Battlemind training with the aim of building psychological resiliency and thereby reducing combat stress reactions (Castro, 2006). Battlemind aims to build on personnel's existing strengths and show how the skills that personnel relied on during deployment can be adapted for the transition home. Post-deployment Battlemind training was evaluated in a cluster RCT (Adler *et al*, 2009), which compared Battlemind training delivered in either large or small groups with debriefing and stress education. The study found that compared with stress education, personnel with high combat exposure who had received Battlemind reported fewer symptoms of post traumatic stress disorder (PTSD) and sleep problems 4 months after returning home. Those who received Battlemind in large groups also reported fewer symptoms of depression, regardless of level of combat exposure.

The current study was proposed to examine whether Battlemind would also prove more beneficial to UK AF personnel than the current set of post-deployment briefs. The aim of the study was to compare the efficacy of an anglicised version of post-deployment Battlemind training with the standard stress and homecoming brief currently delivered to UK AF personnel. The primary study hypothesis was that personnel who received Battlemind would report better mental health and less risk-taking behaviour than those who received the standard brief. The secondary hypothesis was that the effect of study arm on these outcomes would be moderated by level of combat exposure.

2.0 ADAPTING POST-DEPLOYMENT BATTLEMIND TRAINING FOR THE UK ARMED FORCES

Before commencing the study, the US Battlemind materials were adapted for the UK. The materials included a PowerPoint presentation with facilitator notes, video clips and a handout. Members of the US Battlemind team presented Battlemind to some members of the UK AF, who gave feedback to the UK research team about aspects of the brief that they felt needed to be amended to a UK context. Most

amendments were minor, such as changing colloquialisms. However, one subject dealt with in US Battlemind - the carrying of a loaded weapon after returning home - was not considered relevant to the UK. We took the opportunity to replace this subject with discussion of alcohol misuse, which is known to be common in the UK AF (Fear et al, 2007). The topic of risky driving was also amended to make it consistent with the feedback we received on how UK AF personnel drive in theatre. Three video clips that help to illustrate the messages in Battlemind were remade using adapted US scripts and with volunteer actors from the UK AF. A booklet given to all Battlemind participants at the end of the brief was adapted from the US handout. The booklet summarises the messages discussed during the brief.

3.0 FACILITATOR TRAINING

Prior to commencing the study, twelve AF personnel who were part of the Cyprus decompression team were trained to deliver Battlemind and the standard brief: three Royal Navy community mental health nurses (CMHNs), two Royal Navy chaplains, two commissioned officers (one Army, one Royal Marines) and five senior non-commissioned officers (one Army and four Royal Marines). All professions delivered both the standard brief and Battlemind, with the exception of the chaplains who delivered only the homecoming section of the standard brief. A member of the US Battlemind team assisted with some of the training sessions.

4.0 DESIGN AND METHODS

4.1 Design

The study design was a cluster RCT, with company as the unit of randomisation.

4.2 Participants

Eligible participants were UK Armed Forces personnel returning from a tour of duty in Afghanistan. Units comprising mainly reserve personnel or headquarters staff were excluded. Individual augmentees who came through the decompression facility without a formed unit were also excluded.

4.3 Procedures

Recruitment and baseline assessment were conducted when personnel were transiting through the third location decompression facility in Cyprus, before continuing their journey home. Zelen pre-consent randomisation was used, as appropriate for a cluster RCT (Zelen, 1979). Before receiving their brief, personnel were informed about the study by a member of the research team and were provided with a participant information sheet. All participants gave written informed consent. Participants completed the baseline questionnaire which included questions about demographic information, combat experiences and mental health. The primary outcomes were symptoms of post traumatic stress disorder (PTSD) and common mental disorders. PTSD was assessed with the PTSD checklist, civilian version (PCL-C) (Weathers et al, 1994) and symptoms of common mental disorders were assessed with the 12-item General Health Questionnaire (GHQ-12) (Goldberg and Williams, 1988). Participants were defined as having a common mental disorder if they scored ≥ 4 on the GHQ-12. Combat exposure was assessed with a 14-item scale adapted from the US scale (Killgore et al, 2008). After receiving their brief, participants completed a 3-item feedback questionnaire.

Participants were approached to complete a follow-up questionnaire after 4-6 months. If a large number of participants were based at a single unit, the research team visited the unit to conduct the follow-up assessment. Other participants were mailed the questionnaire. If participants had provided an e-mail

address, an electronic version of the questionnaire was provided. Non-responders were sent additional mailouts. All participants who completed baseline and follow-up questionnaires were entered into a prize draw, with a chance to win one of ten prizes ranging from £500 to £50.

The follow-up questionnaire included the PCL-C and GHQ-12 plus additional measures of mental health and risky behaviours. These included the Alcohol Use Disorders Identification Test (AUDIT) (Babor et al, 2001) to assess alcohol misuse. Alcohol misuse had not been assessed at baseline because UK AF personnel do not drink alcohol while deployed therefore the questions would have been immaterial. Participants also completed a feedback questionnaire; this repeated the three items asked at baseline plus an additional question about how much the brief had helped them with the homecoming transition.

The study received ethical approval from the Ministry of Defence Research Ethics Committee (MoDREC) and the King's College Hospital Research Ethics Committee.

4.4 Statistical analysis

Analyses were conducted using the statistical packages STATA 10.1 and R 2.11.

To compare Battlemind and the standard brief on study outcomes, mixed effects models were used to take account of possible cluster effects. To examine whether combat exposure moderated the effect of study arm, the analyses were repeated, entering an interaction term of study arm by combat exposure.

5.0 RESULTS

A total of 2443 personnel participated in the study; sample characteristics at baseline are shown in Table 1. There were differences between the study arms in gender, engagement type, service and rank therefore analyses to compare the two arms on outcomes adjusted for these variables. The follow-up questionnaire was completed by 1616 (66%) participants. Those who completed the follow-up were more likely than non-completers to be in the Battlemind arm of the study, to be older, to be in the Army rather than the Royal Marines and to be of non-commissioned or officer rank rather than junior rank. Time to receipt of a completed follow-up questionnaire was longer in the standard brief than in the Battlemind arm. Analyses also adjusted for these differences. There were no differences between completers and non-completers of the follow-up questionnaire in terms of baseline mental health or in their baseline feedback about the brief they received (Figure 1).

5.1 Feedback

Feedback did not differ significantly between the Battlemind and standard brief groups (Figure 1). Most feedback was favourable with over 80% in both study arms reporting being somewhat/very satisfied with the brief they received. Approximately 75% reported finding the brief somewhat/very useful and over 80% reported that it was somewhat/very relevant for personnel returning from deployment.

Ratings of satisfaction, usefulness and relevance were somewhat lower at follow-up (Figure 2) than at baseline but again did not differ between the study arms. Helpfulness ratings at follow-up were higher for Battlemind than the standard brief, but this difference was no longer significant after adjusting for those variables that differed between the study arms at baseline and/or predicted non-completion at follow-up i.e. gender, engagement type, service, rank, and age.

5.2 Mental Health

Prevalence of probable post-traumatic stress disorder (PTSD) was 2.4% ($n = 59/2420$) at baseline and 3.9% ($63/1597$) at follow-up. In view of the small numbers having probable PTSD, the PCL-C continuous score was used in the mixed effects model. Prevalence of caseness on the GHQ-12 was 15.2% ($367/2421$) at baseline and 14.0% ($223/1599$) at follow-up. In the mixed effects model (see Table 2), we did not find a statistically significant difference between Battlemind and the standard brief in either symptoms of PTSD or GHQ-12 caseness.

5.3 Alcohol misuse

Overall AUDIT scores did not differ significantly between the two groups but became significant after adjusting for level of combat exposure (mean difference -0.75 (95% confidence interval -1.47 to -0.04), $P = 0.04$). Those who received Battlemind ($n=263$, 33.5%) were less likely to be classified as binge drinkers than those in the standard brief (263 (33.5%) compared with 317 (39.3%), $\chi^2 = 5.83$, $P = 0.02$). This effect remained in the adjusted analysis (see Table 2).

5.4 Combat exposure as a moderator of effect

When the possible moderating effect of combat exposure was examined, we did not find a significant interaction between combat exposure and study arm on mental health or alcohol misuse outcomes.

6.0 DISCUSSION

This study did not find a difference in mental health outcomes between an anglicised version of post-deployment Battlemind training and the standard brief currently delivered to UK AF personnel. However, those who received Battlemind were less likely to report binge drinking than those who received the standard brief. Both briefs were well received and there was not a preference for one of the briefs at baseline or follow-up.

It is possible that we did not duplicate the findings of the US Battlemind study because of differences in mental health between the two populations, in that rates of PTSD are much higher in the US than the UK AF. However rates of common mental disorder (not assessed in the US study) are much higher than PTSD in our sample but we did not find an effect on this outcome either. It may be the case that the UK standard brief is able to address issues of mental health to a similar standard as Battlemind. It is possible that the standard briefs used as comparison conditions in the two studies differ in efficacy because of content or method/style of delivery.

Unlike the US study (Adler et al, 2009), we did not find a moderating effect of combat exposure. It may be that the longer US deployments result in higher levels of combat exposure and it is at these higher levels that effects are found. However, we are unable to compare levels of combat exposure between the US and UK samples.

Alcohol misuse is high among the UK AF (Fear et al, 2007; Fear et al, 2010) and is much more common than PTSD, therefore our finding that Battlemind had an effect on the reporting of binge drinking is of interest. Why Battlemind should have had an effect on binge drinking but not mental health is unclear. It may be that the alcohol message came across more clearly or was more salient to participants in the Battlemind arm. Although the issue of misusing alcohol is addressed in both briefs, it is dealt with in slightly more depth in Battlemind, for example, one of the video clips illustrates using alcohol to cope with problems. Our result should be treated with some caution given that we did not measure binge drinking at baseline and also that we examined several outcomes, thus increasing our likelihood of chance

findings. However, a Cochrane review of brief alcohol interventions in primary care (Kaner 2007) has shown that it is possible for a low intensity intervention to achieve a reduction in alcohol intake. The US Battlemind study (Adler et al, 2009) did not report findings for alcohol so we are unable to compare the studies on this outcome.

In looking at how the efficacy of the briefs could be improved, it may be that the briefs are trying to achieve too much in too short a time. Both Battlemind and the standard brief are short interventions (of less than an hour) yet they cover (albeit in different ways) alcohol, risky driving, re-establishing relationships at home, signs of problems and sources of help. In the US, post-deployment Battlemind is designed to be part of a Battlemind training package which is also delivered at other parts of the deployment cycle so the messages can be reinforced. Two UK studies that have examined the possible benefits of pre-deployment briefs reported differing results. Sharpley et al (2008) did not find evidence of benefit, however, a survey conducted with UK personnel during deployment on Op TELIC (the codename for UK military operations in Iraq since 2003), found that those who reported receiving a pre-deployment stress brief reported better mental health than those who had not received a brief (Mulligan et al, 2010a). In the current study we did not ask if personnel had received a stress brief before their deployment so it is not possible to tell whether there are any cumulative benefits to receiving a brief both before and after deployment. Almost all other post-deployment interventions have also been single session (Mulligan et al 2010b) therefore other research in the area is not informative.

The most appropriate timing of the briefs is also of interest. When planning this study, there was much discussion about whether the study should be conducted during decompression or during ‘normalisation’ (the period of time spent in a base location after returning home prior to going on leave). The US Battlemind study was conducted during normalisation. However, for the current study to do this would have meant altering the existing policy of delivering the briefs during the decompression period, which had been in place since 2006. While one view is that personnel would be more receptive to the briefs once they were back at home, another is that it is important to give people messages about possible problems and what to do about them as early as possible. Additionally, decompression provides an opportunity to ensure all unit members receive the briefings, whereas some personnel may not attend briefings delivered once they are back at home because of other taskings. After careful consideration, we did not think there were sufficient grounds for changing the timing of the briefs so the study compared Battlemind with ‘standard care’ as it existed at the time. There may be a benefit to giving a short brief at decompression with more in depth intervention during normalisation but this would require a proper evaluation.

In conclusion, the current study did not replicate the findings of the US Battlemind study but the current study did find some evidence of a possible effect on binge drinking. The difference in outcomes between the US and UK studies highlights the importance of conducting a robust evaluation when adapting an intervention for a new population.

Table 1: SAMPLE CHARACTERISTICS AT BASELINE

	Battlemind (n=1108)	Standard brief (n=1335)	Comparison between study arms	
			Test statistic	<i>P</i>
Gender, n (%)				
Male	1095 (98.9)	1306 (97.8)	χ^2 (df=1) = 4.34	0.04
Age (in years), mean (S.D.)	27.2 (6.6)	27.0 (6.5)	t (df=2437) = -0.89	0.37
Engagement type, n (%)				
Regular	1055 (96.9)	1244 (94.4)	χ^2 (df=1) = 8.64	0.003
Reserve	34 (3.1)	74 (5.6)		
Service, n (%)				
Royal Navy	13 (1.2)	49 (3.7)	χ^2 (df=2) = 82.48 (analysis excludes RAF)	<0.0001
Army	710 (64.2)	622 (46.7)		
Royal Marines	379 (34.3)	662 (49.7)		
Royal Air Force	4 (0.4)	0 (0)		
Rank, n (%)				
Junior ranks	798 (72.2)	1037 (78.0)	χ^2 (df=2) = 11.24	0.004
SNCO	191 (17.3)	180 (13.5)		
Commissioned Officer	117 (10.6)	112 (8.4)		
Combat exposure score (mean, SD)	6.60 (4.12)	6.87 (4.08)	t (df=2428) = 1.64	0.10
Common mental disorders (GHQ-12) Case (n, %)	169 (15.4)	198 (14.9)	χ^2 (df=1) = 0.12	0.73
Symptoms of PTSD (PCL-C) Case (n, %)	32 (2.9)	26 (2.0)	χ^2 (df=1) = 2.40	0.12
Continuous score, median (IQR)	21 (18 – 26)	20 (17 – 26)	Z = -0.06	0.95

Numbers may not total 2443 due to missing data

**TABLE 2. MIXED EFFECTS MODELS COMPARING STUDY ARMS ON SYMPTOMS OF PTSD,
COMMON MENTAL DISORDERS AND BINGE DRINKING**

Study arm:	PCL-C total score		GHQ-12 caseness	Binge drinking caseness
	Coefficient	SE	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Standard	-	-	1	1
Battlemind	-0.00	0.02	0.84 (0.57 – 1.23)	0.73 (0.58 – 0.92)

Analyses adjusted for baseline score (PCL-C and GHQ-12), age, gender, service, rank, engagement type, and months to follow-up.

PCL-C – Post traumatic stress disorder checklist; GHQ-12 – General Health Questionnaire – 12 item

Figure 1: Feedback on briefs at baseline

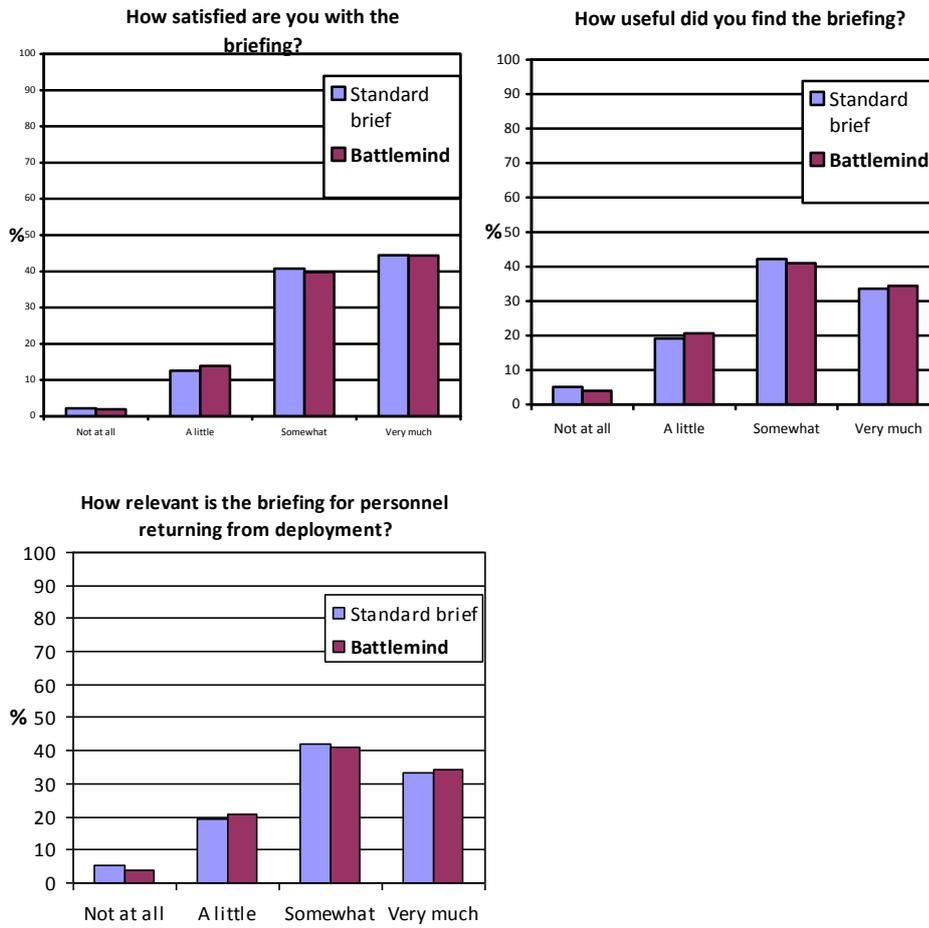
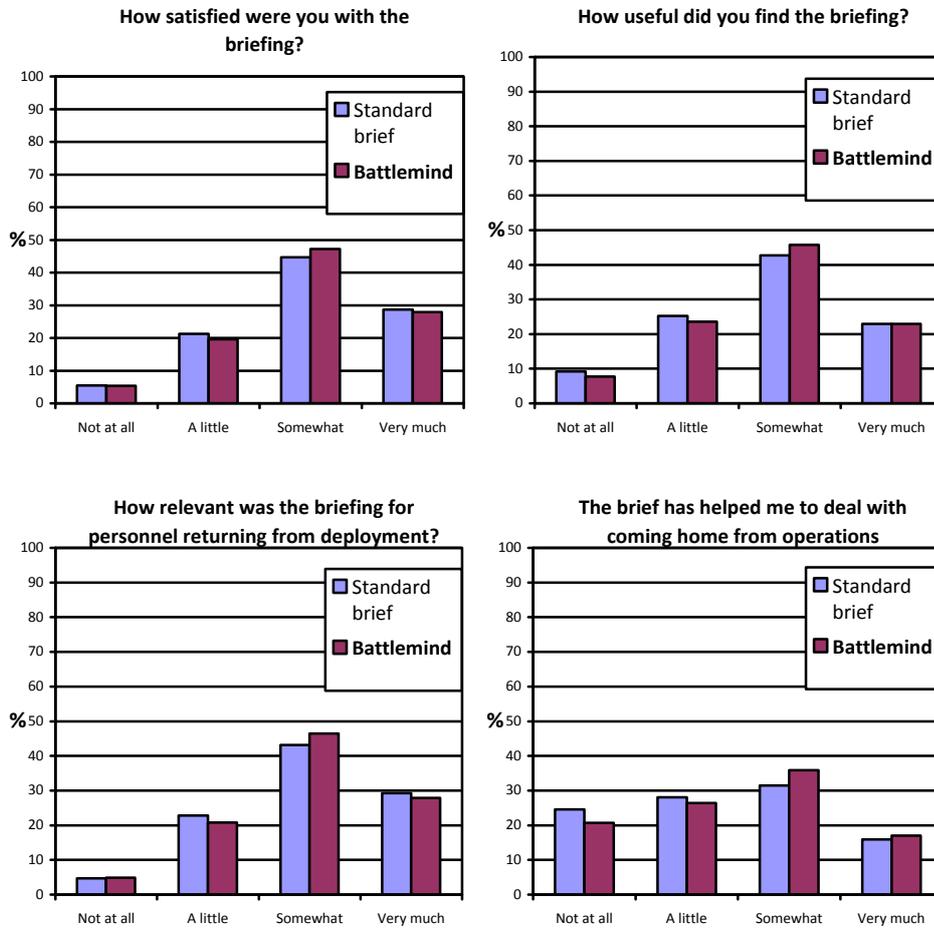


Figure 2: Feedback on briefs at follow-up



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