

Impact on Mental Health of Deploying as an Individual Augmentee in the U.K. Armed Forces

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ABSTRACT Armed Forces personnel who deploy as individual augmentees (IAs), with a unit other than their formed unit, often fill shortages or provide specialized knowledge or skill sets. This article examined the effect of deploying as an IA on mental health outcomes and unit cohesion. A U.K. military cohort study was used to compare IAs ($n = 1352$) with personnel who had deployed with a formed unit ($n = 2980$). Differences between the groups in questionnaire assessed symptoms of post-traumatic stress disorder (PTSD Checklist-Civilian Version), common mental disorders (General Health Questionnaire-12) and alcohol misuse (Alcohol Use Disorders Identification Test) were examined with logistic and negative-binomial regression analyses. There was no difference between IAs and those who deployed with a formed unit in level of unit cohesion, symptoms of post-traumatic stress disorder or common mental disorder. Deployment as an IA was associated with less alcohol misuse (Odds Ratio 0.77, 95% Confidence Interval 0.63–0.94). IAs appeared able to integrate with the group they deployed with as levels of unit cohesion were similar to personnel who deployed with a formed unit. IAs were also at a lower risk of alcohol misuse compared to personnel who deployed with a formed unit.

INTRODUCTION

An individual augmentee (IA) is a member of the military who deploys to an operational role without members of his/her usual home unit. IAs undertake a variety of roles including reinforcing, or augmenting personnel in a formed unit, working within a unit which does not exist outside of an operational environment (e.g., a deployed headquarters) or may provide specialized knowledge or skill sets. IAs can be assigned individually or together with a small group of personnel, such as a specialist medical team. Deploying as an IA has an impact on the level of predeployment training that personnel receive as the IA training package is shorter than the more extensive predeployment training which is completed by individuals deploying as part of a formed unit.¹

Since World War II, theories of combat motivation and demotivation have emphasized the key role of the small group (i.e., that soldiers fight for their colleagues) as opposed to patriotism or ideology.² The influence of the small group depends on the level of morale and cohesion between group members. Following World War II, the influence of small-group psychology also had an impact on the perception of combat breakdown, and the protective effects of unit cohesion for mental health problems are now well recognized.^{3,4}

The reported impact of IA status on health outcomes has varied between studies: one study has shown an increased risk of post-traumatic stress disorder (PTSD) in IA personnel,⁵ whereas two recent studies found no association between being an IA and PTSD.^{6,7} No previous research

has examined specific stressors associated with deploying as an IA and ill-health. In particular, research has not examined whether personnel who deploy together with a formed unit and those who deploy as IAs differ in their levels of unit cohesion.

The aim of this study was to examine the effect of deploying as an IA (rather than as a member of a formed unit) on the reporting of symptoms of PTSD, common mental disorder (CMD) and alcohol misuse, and to assess self-reported levels of unit cohesion.

METHODS

Data were utilized from the first phase of a cohort study of U.K. military personnel ($n = 10272$) who served in the U.K. Armed Forces between January and April 2003.^{8,9} Invited participants were from a random sample stratified by Service, enlistment type (regular or reserve personnel), and deployment status (deployed to Iraq versus not deployed to Iraq). Reserve personnel were oversampled by a ratio of 2:1. Data were collected through postal surveys and visits to military bases, using a comprehensive questionnaire.

The analysis sample was limited to regular male personnel who had deployed on any TELIC operation (TELIC was the U.K. codename for operations in Iraq), this resulted in a sample of 1352 in the IA group, and 2980 in the group who deployed with a formed unit. These comparisons were limited to regular male personnel because the sample only included small numbers of female personnel and previous research has shown that there are differences in health outcomes between men and women.^{10,11} Personnel enlisted as reserves were more likely to be IAs (78.9% compared to 31.2% among regular personnel, $\chi^2(1) = 617.2, p < 0.001$), and there were few reserve personnel who had deployed with a formed unit ($n = 159$). Previous research on this cohort has

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shown that there are several differences between regulars and reserves, including differences in health following deployment.^{8,12} Therefore reserve personnel were excluded.

Measures

Participants provided information on sociodemographics, family background, service characteristics, deployment experiences, and current health. Family background was assessed with 16 questions on childhood experiences that were used to create a composite score for childhood adversity, increasing scores equate to greater adversity.¹³ Questions related to deployment experiences included the area of deployment, time spent in a forward area, potential adverse experiences (to oneself and others), and perceptions of deployment experiences (thinking one might be killed and whether work matched one's ability or experience).

Unit cohesion was generated as a construct based on four items taken from a section asking personnel about their perceptions of their deployment and included: "I felt a sense of comradeship (or closeness) between myself and other people in my unit," "I could have gone to most people in my unit if I had a personal problem," "My seniors were interested in what I did or thought," and "I felt well informed about what was going on." The questions were measured on a five-point scale from "strongly disagree" to "strongly agree." These were recoded on a four-point scale, with the central category for "neutral" coded as missing.¹⁴ The scale reliability was acceptable (Cronbach's $\alpha = 0.79$). The unit cohesion construct was generated through principal component analysis of a polychoric correlation matrix. The principal component analysis resulted in a one-factor solution and the general factor explained 66.6% of the total variance. All variables loaded on the general factor, with factor loadings ranging between 0.68 and 0.79.

PTSD was measured with the 17-item Centre for PTSD Checklist-Civilian Version (PCL-C), with cases defined as those scoring 50 or greater.¹⁵ Because of insufficient numbers of PTSD cases, the total PCL-Score was used as the outcome measure in the multivariate analyses. The PCL-Score was recoded from 17 to 85 to range from 0 to 68 for the purpose of the multiple variable analyses. Symptoms of CMD were measured with the General Health Questionnaire 12 (GHQ-12) with cases defined as those scoring four or more.¹⁶ Alcohol misuse was measured with the Alcohol Use Disorders Identification Test, cases were defined as those scoring 16 or greater.¹⁷

Analyses

The sociodemographic characteristics, predeployment, and combat experiences were compared between personnel deployed as IAs and those who deployed with a formed unit. Proportions were calculated and statistical significance was assessed with Pearson's χ^2 statistic. Associations between group membership and health outcomes were assessed with

odds ratios (OR), calculated with binary logistic regression for CMD and alcohol misuse and incidence rate ratios (IRR) calculated with negative binomial regression for symptoms of PTSD.¹⁸ We adjusted for variables which were related to deploying as an IA or the health outcomes. For all models, the sociodemographic and predeployment variables were fitted first followed by the deployment and postdeployment risk factors. The cutoff for inclusion in the model was set at p values less than or equal to 0.10.

RESULTS

Personnel who deployed as IAs were older, had higher educational attainment, held higher ranks, and were more likely to serve in the Royal Air Force (RAF) compared to those who deployed with a formed unit (Table I).

Table II shows the comparisons between personnel who deployed as IAs and those who deployed with a formed unit on deployment experiences and factors associated with deployment. IAs were less likely than those who deployed with a formed unit to have spent time in a forward area, to have held a combat role in theater, to report experiencing a traumatic event or thinking one might be killed, and more likely to perceive work in theater as outside their ability or experience. Levels of unit cohesion did not differ between personnel who deployed as IAs and those who deployed with a formed unit.

There was no difference in prevalence of probable PTSD between personnel who deployed with a formed unit (3.9%) and personnel who deployed as IAs (4.2%; $\chi^2(1) = 0.187, p = 0.666$). There was no difference between IAs and those who deployed with a formed unit in symptoms of PTSD or CMD (Table III). Personnel who deployed with a formed unit were more likely than IAs to be heavy drinkers, this effect held after adjustment for age, relationship status, educational status, childhood adversity, rank, Service, prior deployment experience, traumatic events to self, and whether work in theater matched ability/experience (Table III). Adjusting for combat role and unit cohesion did not change the association between deploying with a formed unit and alcohol misuse; these variables were removed from the final model since the association with alcohol misuse was not significant ($p > 0.10$).

DISCUSSION

The main finding of this study was that deploying as an IA was not associated with worse mental health (including symptoms of PTSD). Indeed, the results demonstrated that IAs were less likely to report alcohol misuse than regular personnel who deployed with a formed unit. There was no indication of decreased levels of unit cohesion for personnel who deployed as IAs compared to those who deployed with a formed unit.

There were several differences between personnel who deployed as IAs and those who deployed with a formed unit with regards to predeployment factors and deployment

TABLE I. Descriptive factors of regular male IA personnel, and personnel who deployed with a formed unit, number (*n*), percentage (%) or mean and 95% confidence interval, and *p*-value for test statistics are shown.

Sociodemographic and Predeployment Variables	Individual Reinforcement (IA) (<i>n</i> = 1352)	Deployed with Formed Unit (<i>n</i> = 2980)	<i>p</i>
	<i>n</i> (%)	<i>n</i> (%)	
Age (Years)	33.0 [32.6–33.4] ^a	31.3 [31.1–31.6] ^a	<0.001
Single	299 (17.1)	715 (18.9)	0.190
Educational Status			
O Levels or Less	631 (49.1)	1648 (58.1)	<0.001
A Levels or Equivalent	408 (31.8)	842 (29.7)	
Degree	245 (19.1)	347 (12.2)	
Childhood Adversity			
0/1	319 (23.6)	682 (22.9)	0.323
2/3	447 (33.1)	935 (31.4)	
4/5	270 (20.0)	590 (19.8)	
6 or More	316 (23.4)	773 (25.9)	
Rank			
Other	219 (16.3)	691 (23.4)	<0.001
Junior Non-commissioned Officer	457 (34.1)	1053 (35.7)	
Senior Non-commissioned Officer	381 (28.4)	820 (27.8)	
Officer	283 (21.1)	390 (13.2)	
Service Branch			
Royal Navy	124 (9.2)	273 (9.2)	<0.001
Royal Marines	59 (4.4)	188 (6.3)	
Army	795 (58.8)	2071 (69.5)	
RAF	374 (27.7)	448 (15.0)	
Prior Deployment Experience	1002 (74.1)	2251 (75.5)	0.315

Note: Numbers may not add up to total because of missing data. ^aMean and 95% confidence interval.

experiences. These differences mainly reflect differences in their roles on deployment and that a specialist skill set often is required from personnel who deploy as IAs. For example, personnel who deployed as IAs were older, better educated, and held higher ranks. They were also less likely to have a combat role on deployment and reported fewer potentially traumatic experiences; this may reflect that many deployed headquarters employ IAs and these units tend to be located in

TABLE II. Deployment experiences for regular male IA personnel, and personnel who deployed with a formed unit, number (*n*), percentage (%) or mean and 95% confidence interval, and *p*-value for test statistics are shown.

Deployment-Related Variables	Individual Reinforcement (IA)	Deployed with Formed Unit	<i>p</i>
	(<i>n</i> = 1352)	(<i>n</i> = 2980)	
	<i>n</i> (%)	<i>n</i> (%)	
Theater of Deployment			
TELIC 1	1072 (79.3)	2407 (80.8)	0.256
TELIC 2 or Later	280 (20.7)	573 (19.2)	
Time in Forward Area			
Not at All	603 (45.4)	1107 (38.2)	<0.001
Up to 1 Week	170 (12.8)	370 (12.8)	
Up to 1 Month	222 (16.7)	598 (20.6)	
More than 1 Month	333 (25.1)	827 (28.5)	
Main Duty in Theater			
Combat	304 (22.5)	1044 (35.1)	<0.001
Combat Support	153 (11.3)	370 (12.4)	
Combat Services Support	892 (66.1)	1561 (52.5)	
Experienced 3 or More Adverse Experiences to Self	318 (23.5)	829 (27.8)	0.003
Witnessed 3 or More Adverse Experiences to Others	263 (19.5)	596 (20.0)	0.675
Thought Might be Killed	726 (54.4)	1733 (58.5)	0.011
Work in Theater Matched Ability/Experience			
Within Ability/Experience	976 (80.7)	2313 (85.7)	0.001
Above Ability/Experience	61 (5.1)	112 (4.2)	
Beneath Ability/Experience	116 (9.6)	190 (7.0)	
Outside Ability/Experience	57 (4.7)	85 (3.2)	
Unit Cohesion	0.0 [–0.05, 0.06] ^{1a}	0.04 [0.00, 0.07] ^a	0.293

Note: Numbers may not add up to total because of missing data. ^aMean and 95% confidence interval.

TABLE III. Health outcomes in male regular IA personnel, and regular personnel who deployed with a formed unit. Number (*n*), percentage (%), or median and interquartile range, unadjusted and adjusted IRR, OR, and 95% CI.

	Cases, <i>n</i> (%)	Unadjusted OR/IRR† (95% CI)	Adjusted OR/IRR† (95% CI)
Symptoms of PTSD			
Deployed With a Formed Unit	3 [0–9]*	—	—
IA	3 [0–9]*	0.98† (0.89–1.09)	1.03† (0.93–1.14) ^a
CMD			
Deployed With a Formed Unit	532 (18.1)	—	—
IA	257 (19.3)	1.08 (0.92–1.28)	1.09 (0.91–1.32) ^b
Alcohol Misuse			
Deployed With a Formed Unit	591 (20.1)	—	—
IA	204 (15.3)	0.72 (0.60–0.85)	0.79 (0.65–0.98) ^c

†Incidence rate ratios. *Median number of symptoms and interquartile range (scale ranges from 0 to 68). ^aAdjusted for factors associated with deploying as an IA or a formed unit (rank, Service branch, time spent in a forward area, traumatic events to self, thought might be killed, work in theater matched ability/experience, and unit cohesion) and factors related to symptoms of PTSD (childhood adversity, relationship status, prior deployment experience, and traumatic events to others). ^bAdjusted for factors associated with deploying as an IA or a formed unit (age, rank, Service branch, traumatic events to self, thought might be killed, work in theater matched ability/experience, and unit cohesion) and factors related to CMD (childhood adversity, and theater of deployment). ^cAdjusted for factors associated with deploying as an IA or a formed unit (age, educational status, rank, Service branch, traumatic events to self, and work in theater matched ability/experience) and factors related to alcohol misuse (relationship status, childhood adversity, and prior deployment experience).

safer areas of theater. These differences also reflect the fact that more IAs serve in the RAF. RAF personnel are more often in technical trades and have often completed higher education or technical training before enlistment, which may explain the differences in levels of education and rank. We found that personnel who deployed as IAs were less likely to perceive their work in theater as within their ability or experience compared to those who deployed with a formed unit. However, the vast majority of both IAs, and those who deployed with a formed unit, felt that their work in theater matched their ability or experience (>80%).

Our results are consistent with a previous study of U.K. peacekeepers that also did not find differences in PTSD between personnel who deployed with a formed unit and those who deployed as IAs.⁶ Likewise, there was no main effect of deploying as an IA on the risk of PTSD in U.K. personnel who deployed to the 1991 Gulf War.⁵ There was however an interaction between deploying as an IA and role on deployment, with an increased risk of PTSD for IA personnel in combat roles as compared to personnel in services support or combat services support roles.⁵ There was no indication of such an interaction in this study (data not shown).

More recently, research into the mental health of U.K. personnel who were on deployment in Iraq showed that deploying as an IA was not associated with PTSD.⁷ Similarly, a recent U.S. study of marines who had deployed to Iraq and Afghanistan showed that there was no association between deploying as an IA and PTSD.¹⁹ This study did show that there was a small but significant association between deploying as an IA and deployment-related stressors including problems at home, problems with leadership, and issues related to the deployment environment and length of deployment.¹⁹ This suggests that deployment-related stressors other than combat related factors may be a particular concern for personnel deploying as IAs. This also fits with

our finding of an association between deploying as an IA and perceiving of work as outside one's ability or experience.

Research of the association between deploying as an IA and CMD is more varied. Although the study by Mulligan and colleagues showed similar results to those reported here, that there is no association between deploying as an IA and CMD, this was not the case for the study of peacekeepers.^{6,7} Greenberg et al⁶ found that deploying as an IA was associated with an increased risk of CMD. This difference may reflect the differences in the nature of duties carried out by troops during peace support operations, which may be less high profile and therefore perceived as less rewarding.

There is limited research of the association between deploying with a formed unit and alcohol misuse. The increased risk of alcohol misuse for personnel who deployed with a formed unit compared to IAs was in line with the demographic characteristics of this group, as they were younger, held lower ranks, and were more likely to have a combat role on deployment. These are factors which have previously been shown to be associated with alcohol misuse among military personnel.^{9,20} Although, adjusting for these factors in this study did not account for the difference in alcohol misuse between personnel who deployed as IAs and those who deployed with a formed unit.

Limitations of this study include the use of self-reported measures to assess mental health outcomes, which may result in exaggerated estimates. Outcomes represent probable mental illness, except for PTSD which was measured as the number of symptoms. The study was limited by the data collected in the larger cohort study and therefore detailed information on experiences of IA personnel, such as length of time embedded in unit before deploying and length and nature of postdeployment reintegration could not be examined. Differences in predeployment training between IA and personnel who deployed with their parent units were also not available. Although we were able to control for family

background, including childhood adversity and misconduct, we were not able to control for childhood sexual abuse. The unit cohesion measure had good face validity and satisfactory reliability, but has yet to be validated on this population. The sample is restricted to U.K. regular personnel who had deployed during the early phases of the Iraq war and may not be generalizable to reserve personnel or those who deployed during the later phases of the Iraq war or to Afghanistan. It is also possible that these findings would not replicate to IA personnel of other Armed Forces, such as American IAs, that have served in Iraq and Afghanistan, despite fighting a common enemy in the same terrain and employing similar tactics. There are several differences between the U.K. and U.S. Armed Forces, including differences in the healthcare provision, length of deployment, and the sociodemographic structure, such that U.S. personnel tend to be younger and employ more reserve personnel. Research has shown that there are several differences in the postdeployment health of U.K. and U.S. personnel, with higher U.S. prevalence of PTSD and a substantial increase in PTSD prevalence since return from deployment found in U.S. but not in U.K. studies.^{9,21} In contrast, self-reported rates of alcohol misuse tend to be higher in U.K. compared to U.S. military personnel.^{9,22–24}

This study suggests that, in the main, regular personnel who deployed as IAs were able to integrate with the group they deployed with as levels of unit cohesion did not differ from those who deployed together with a formed unit. Furthermore, the lack of a health effect and the high proportion that perceive work on deployment as within their ability suggest that training and preparation for IAs appears to be sufficient for dealing with the demands of deployment as an IA.

Previous research has identified alcohol misuse as a means of social interaction and bonding, but also as a coping mechanism among people who have been through traumatic experiences including military personnel.^{22,25,26} Engaging in social drinking may be a natural extension to continue to foster the bonds that were created between personnel on deployment. Since IAs return to their usual home unit on return from deployment this could explain why there is a difference in rates of alcohol misuse between personnel who deploy with a formed unit and those who deploy as IAs. The impact of high levels of alcohol misuse on operational effectiveness, and long term health, continues to make this a concern for the U.K. Armed Forces. Recent policy changes have been put in place in the three Services to address some of these concerns, but the effect of these has yet to be evaluated.

With the exception of traumatic brain injury which we were not able to examine, we have showed that deploying as an IA does not increase the risk of poor postdeployment mental health of U.K. military personnel.

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