



# Effects of Personnel Tempo on Military Members, their Families, and the Organization: An Annotated Bibliography

Kerry Sudom  
*Conditions of Service 5-3*  
*Directorate of Military Personnel Operational Research and Analysis*

Master Corporal J.A. Eyvindson  
*Directorate of Strategic Regional Intelligence*

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Defence R&D Canada  
Centre for Operational Research and Analysis

Director General Military Personnel Research & Analysis  
Chief Military Personnel

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Author

**(Original signed by)**

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Kerry Sudom, PhD

Approved by

**(Original signed by)**

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Catherine Campbell, MASc

Section Head - Military Personnel Operational Research and Analysis

Approved by

**(Original signed by)**

---

Kelly Farley, PhD

Director Military Personnel Operational Research and Analysis

Approved for release by

**(Original signed by)**

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Susan Truscott, MA, CHRP

Director General Military Personnel Research and Analysis

The opinions expressed in this paper are those of the authors and should not be interpreted as the official position of the Canadian Forces, nor of the Department of National Defence.

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## Abstract

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Personnel tempo (perstempo), the demands military service places on its members, can have impacts at the individual, family, and organizational levels. This annotated bibliography provides an overview of the review papers and research studies conducted both in the CF and other military research organizations on the effects of personnel tempo (including optempo or the pace of military operations, time away, and workload) on important individual, family, and organizational outcomes, and variables that may buffer or exacerbate these outcomes. The research suggests that frequent and longer deployments, as well as those of a more hostile nature, tend to be associated with more adverse outcomes. The types of stressors experienced by military members vary throughout the deployment cycle, and some reports have indicated that experiences vary depending on factors such as type of unit and reserve versus regular force status. Despite the evidence for the negative impacts of high perstempo, it appears that if time away is not excessive, deployments can have a positive effect on retention, in that they allow personnel to put their skills and training to use. In addition, researchers have identified a number of factors that may buffer individuals against the negative impacts of stressors associated with military service, such as adaptive coping styles. Although length and frequency of deployments can play a critical role in determining whether adverse outcomes will become evident, other factors, such as perceived support from superiors, may also be important. With high intensity deployments like the current one in Afghanistan, issues of perstempo will become increasingly important. The effects of perstempo on military personnel, their families, and the military organization will become increasingly evident. Learning from past research, such as that identified in the present report, is an important step in identifying the costs and benefits of operating in a high perstempo environment.

## Résumé

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La fréquence de déploiement du personnel, qui constitue une exigence du service militaire, peut avoir une incidence sur le militaire, sa famille et l'organisation. Cette bibliographie commentée donne un aperçu des articles de synthèse et des études menées par les FC et des organismes militaires de recherche sur les effets majeurs de la fréquence de déploiement du personnel (dont le rythme opérationnel ou le rythme des opérations militaires, la période d'absence et la charge de travail) pour le militaire, sa famille et l'organisation ainsi que sur les facteurs atténuants ou amplificateurs. Les études suggèrent que les déploiements fréquents et de longue durée ainsi que ceux dans un environnement hostile semblent entraîner des conséquences plus néfastes. Le type d'agents stressants avec lesquels doivent composer les militaires varie durant le cycle de déploiement. Certains rapports ont indiqué que les expériences personnelles varient selon certains facteurs tels que le type d'unité et le statut de réserviste ou de membre de la Force régulière. Malgré les éléments probants de conséquences néfastes dues à une fréquence élevée de déploiement du personnel, il semble que si la période d'absence n'est pas trop longue, le déploiement peut avoir un effet positif sur la conservation de l'effectif étant donné que le déploiement permet aux militaires de mettre leurs compétences et leur instruction à profit. En outre, des chercheurs ont identifié certains facteurs qui peuvent atténuer les répercussions négatives des agents stressants liés au service militaire, par exemple de bonnes capacités d'adaptation. Bien que la longueur et la fréquence des déploiements semblent jouer un rôle déterminant pour établir s'il y aura des conséquences néfastes, d'autres facteurs, notamment le soutien perçu des supérieurs, peuvent également s'avérer importants. En raison des déploiements dans le cadre d'opérations de haute intensité comme celles en Afghanistan, les questions liées à la fréquence de déploiement du personnel revêtent une importance encore plus grande. L'incidence de la fréquence de déploiement du personnel sur les militaires, leur famille et les organisations militaires deviendra de plus en plus évidente. Tirer profit des recherches antérieures, telles que celles énoncées dans le rapport, constitue une étape essentielle pour déterminer les coûts et les avantages d'évoluer dans un environnement où la fréquence de déploiement du personnel est élevée.

# Executive Summary

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## Effects of Personnel Tempo on Military Members, their Families, and the Organization: An Annotated Bibliography

K. Sudom and J. Eyvindson  
DRDC CORA  
June 2008

### Aim

Personnel tempo (perstempo), the demands military service places on its members, can have a number of adverse impacts at the individual, family, and organizational levels. The aim of this paper was to provide an overview of the existing research on the impacts of perstempo on military members, their families, and the military organization.

### Method

A review of the literature on the effects of personnel tempo (including optempo or the pace of military operations, time away, and workload) on important individual, family, and organizational outcomes, and variables that may buffer or exacerbate these outcomes was undertaken using various data sources (e.g., databases such as PsycInfo). The results were compiled into an annotated bibliography.

### Findings

The available research suggests that longer, more frequent, and hostile deployments tend to be associated with numerous adverse outcomes (e.g., greater symptoms of psychological distress, lower motivation). However, it appears that if time away is not excessive, deployments can have a positive impact on retention. Indeed, when they are deployed, many military members feel that they are utilizing their skills and making a significant contribution to defence. In addition to length and frequency of deployments, other factors such as perceived support from superiors and the ability to find meaning and challenge in one's work, may play an important role in determining whether adverse outcomes associated with perstempo will be evident and may buffer individuals against such outcomes.

A variety of deployment-related stressors have been reported, and these appear to vary in type and magnitude throughout the deployment cycle. Higher levels of stress were generally found at the pre-deployment phase, a time when issues surrounding preparation for deployment and the anticipated separation from family are of paramount concern. Importantly, deployment-related stressors can have negative impacts on military personnel.

With high intensity deployments like the current one in Afghanistan, issues of perstempo will become increasingly important. The impacts of perstempo on military personnel, their families, and military organizations will become increasingly evident. Learning from past research, such as that identified in the present report, is an important step in identifying the costs and benefits of operating in a high perstempo environment, so that areas for intervention to enhance the well-being of military members and their families can be targeted.

# Sommaire

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Les effets de la fréquence de déploiement du personnel sur les militaires, leur famille et l'organisation :  
Bibliographie commentée

K. Sudom et J. Eyvindson  
RDDC CARO  
Juin 2008

## But

La fréquence de déploiement du personnel, qui constitue une exigence du service militaire, peut avoir des répercussions négatives sur le militaire, sa famille et l'organisation. Cet ouvrage a pour but de donner un aperçu des recherches existantes sur l'incidence de la fréquence du déploiement du personnel sur les militaires, leurs familles et l'organisation militaire.

## Méthode

À l'aide de différentes sources de données (p. ex. des bases de données comme PsycInfo), on a passé en revue les publications sur les effets majeurs de la fréquence de déploiement du personnel (dont le rythme opérationnel ou le rythme des opérations militaires, la période d'absence et la charge de travail) pour le militaire, sa famille et l'organisation ainsi que sur les facteurs pouvant atténuer ou amplifier. Les résultats ont été compilés dans une bibliographie commentée.

## Conclusions

Les études suggèrent que les déploiements longs, fréquents et effectués dans des environnements hostiles semblent entraîner de nombreuses conséquences néfastes (p. ex. des signes plus importants de détresse psychologique et une moins grande motivation). Cependant, il semble que si la période d'absence n'est pas trop longue, le déploiement peut avoir un effet positif sur la conservation de l'effectif. D'ailleurs, lorsqu'ils sont en déploiement, bon nombre de militaires estiment qu'ils mettent à profit leurs compétences et qu'ils contribuent positivement à la mission. En plus de la longueur et de la fréquence des déploiements, d'autres facteurs, tels que le soutien perçu des supérieurs et la capacité de donner un sens à son travail et d'y voir un défi à relever, peuvent jouer un rôle déterminant pour établir s'il y aura des conséquences néfastes en raison de la fréquence de déploiement du personnel et s'il est possible de les éviter.

On a répertorié différents agents stressants liés au déploiement qui semblent varier selon le type et l'importance tout au long du cycle de déploiement. En effet, des niveaux de stress élevés correspondaient généralement à la phase précédant le déploiement, période au cours de laquelle les questions liées à la préparation au déploiement et à l'angoisse de la séparation constituent une grande préoccupation. Fait important, les agents stressants liés au déploiement peuvent avoir des répercussions négatives sur le personnel militaire.

En raison des déploiements dans le cadre d'opérations de haute intensité comme celles en Afghanistan, les questions liées à la fréquence de déploiement du personnel revêtent une importance encore plus grande. L'incidence de la fréquence de déploiement du personnel sur les militaires, leurs familles et les organisations militaires deviendra de plus en plus évidente. Tirer profit des recherches antérieures, telles que celles énoncées dans le rapport, constitue une étape essentielle pour déterminer les coûts et les avantages d'évoluer dans un environnement où la fréquence de déploiement du personnel est élevée, de façon à cibler les domaines d'intervention pour améliorer le bien-être des militaires et de leur famille.

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# 1. Introduction

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In recent years, the Canadian Forces (CF) has become increasingly involved in missions and operations, resulting in many members being away from home, combined with an increased garrison workload of those remaining behind. Awareness of the potential negative impacts of heavy workload and deployment load has led to the study of personnel tempo (perstempo), defined as the sum of the demands made by military service upon individual members. Demands of military service include deployment load or the tempo of CF operations (optempo), the time members spend away from home for more than twenty-four hours/overnight, and general workload (garrison load). Perstempo may have important impacts on the individual (e.g. mental health), familial (e.g., family breakdown), and organizational (e.g., readiness, retention) levels. The purpose of the present report was to document, in the form of an annotated bibliography, research conducted by the CF and other militaries on the effects of perstempo (deployments, workload, and time away) on the individual, family, and organizational level.

## 2. Methods

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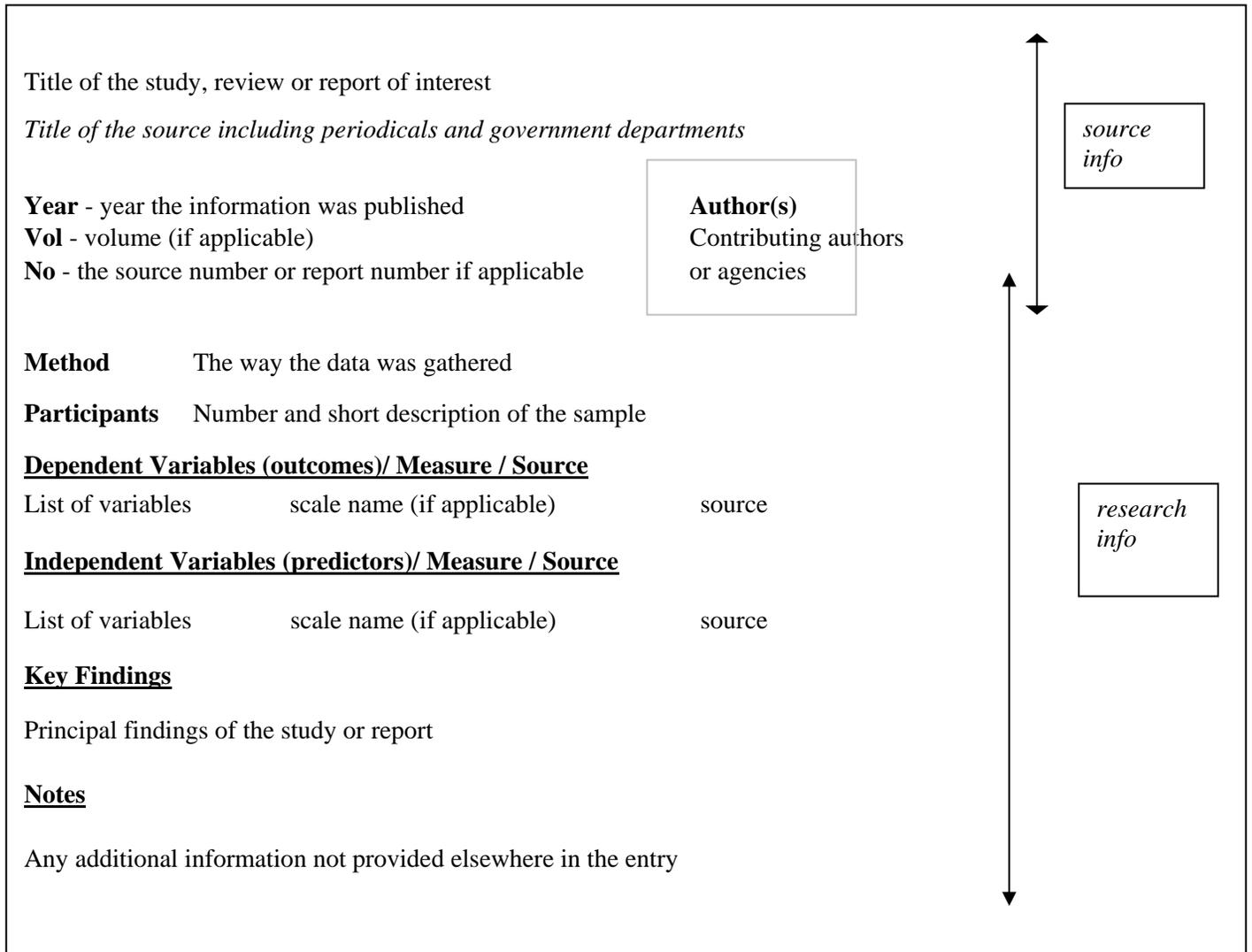
The research papers are organized into a number of sections. First, general papers regarding perstempo and its measurement are presented. Next, the impacts of military service across the deployment cycle (i.e., preparation, deployment, and post-deployment reunion) are discussed for those studies which examined individuals at multiple time points. Following this are papers utilizing cross-sectional data to examine the impacts of deployments and time away at the individual, family, and organizational level. Finally, research studies examining the factors that may buffer or exacerbate the impacts of perstempo are presented. These factors may include individual-level variables (e.g., personality factors that may buffer against the adverse effects of stress) and group/organizational-level variables (e.g., cohesion, leadership).

The Canadian Forces Virtual Library and other databases such as PsycInfo were searched using a developed set of key words (see Table 1). As well, both internal and external military sources were examined, including Defence Research and Development Canada (DRDC), The Technical Cooperation Program (TTCP), the Rand Corporation, and the Director Military Personnel Operational Research and Analysis (DMPORA). Figure 1 describes the information recorded for each entry and how the entries were organized. This document contains the research studies and literature reviews collected as a result of this search. Within each section, the papers are arranged in chronological order.

**Table 1. Key words and concepts used**

<u>Deployment</u>	<u>Military performance</u>	<u>Retention</u>	<u>Well-being</u>	<u>Leader and group factors</u>	<u>Organizational and situational factors</u>	<u>Individual factors</u>
Deployment	Performance	Intention to leave	Well-being, Wellbeing	Group cohesion	Boredom	Coping
Optempo	Readiness	Intention to stay, remain	Mental health	Leadership	Occupational stress	Personality
Worktempo	Technical proficiency	Reenlistment	Emotional health	Morale	Support	Self-efficacy
Deptempo	Demonstrated effort	Turnover	Family health	Communication	Deployment pay	Motivation
Perstempo	Personal discipline		Psychological trauma	Social support	Size	
Operational deployments	Proficiency		Psychological (stress, strain, distress)		Structure	
Pace of (work, deployment ops)			Psychological health		Perceived supportiveness	
Training exercises			Depression		Formal services	
Garrison work load			Alcoholism			
Time away (Days, weeks, months) away			PTSD			
Workload			Physical symptoms			
			Spouse satisfaction			
Role overload			Family wellness			
Family separation			Family adaptation			
Deployment length			Perceived role strain			
Deployment frequency			Perceived role balance			
Deployment intensity			Satisfaction with life			
Number of deployments						
Work overload						
Peacekeeping						

**Figure 1. Organization of the sources for the bibliography**



## 3. Findings

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### 3.1.1 Personnel Tempo and Optempo: Definitions and Measurement

#### The impact of OPTEMPO on soldiers and families

*U.S. Army Medical Research Unit - Europe*

**Year** 1998

**Author(s)**

Adler, A. B.

Golembe, E. H.

**Method** Surveys administered during a deployment to Bosnia

**Participants** 2,256 soldiers and leaders stationed in Germany

#### **Dependent Variables (outcomes)/ Measure / Source<sup>1</sup>**

Career intentions

Effects of deployments on families

Motivation

Pride

Morale

Unit cohesion

#### **Independent Variables (predictors)/ Measure / Source**

Number of deployments

Years of service

#### **Key Findings**

The study aimed to determine a useful measure of optempo, and the impact of optempo on career intentions and well-being. Two ways to measure optempo were identified: adding up the number of deployments, or assessing number of deployments averaged across number of years of service (“deployment load”). It was found that soldiers with fewer years of active duty had been on fewer deployments. However, when number of deployments was averaged across years of service, those with fewer years of active duty had a higher rate of deployments per year, and thus had a higher deployment load. Lower enlisted soldiers had a higher deployment load than NCOs and officers.

One third of soldiers intending to leave the military after their current obligation were doing so because there were too many deployments. Over half of soldiers with families felt that the number of deployments put a strain on their family. High deployment load was associated with lower motivation and pride, but

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<sup>1</sup> Sources of the scales were not specified.

was not related to personal morale or unit cohesion.

The authors suggest that deployment load may be a more effective way of measuring optempo than number of deployments, since it takes into account the rate of deployment (i.e., number of deployments across years of service) rather than the simple number of deployments.

# **Personnel Tempo: Definition, measurement, and effects on retention, readiness and quality of life**

*U.S. Army Research Institute for the Behavioral and Social Sciences*

**Year** 1999

**Author(s)**

Sticha, P. J.

Sadacca, R.

DiFazio, A. S.

Knerr, C. M.

Hogan, P. F.

Diana, M.

**Method** Literature review and analysis of data from the Perstempo Impact Survey, Sample Survey of Military Personnel (SSMP), Total Army Personnel Database (TAPDB), and supplemental data from the Active duty Military Master and Lost Files

**Participants** 4,346 service members from the Army Special Operations Forces (SOF) completed the Perstempo Impact Survey; 28,528 cases from three administrations of the SSMP; administrative records

## **Key Findings**

The literature review revealed that perstempo is difficult to define, track, and measure. There have been inconsistent results regarding the relationship of perstempo to retention, readiness and quality of life outcomes. Perstempo includes all time away from home station, including peace operations, humanitarian assistance/disaster relief, counter-drug operations, and so on. Several studies have revealed that aspects of deployment management, including amount of notification and time between deployments, may be an even greater concern for service members than the actual time away, since uncertainty surrounding a deployment can be a significant source of stress.

The regression analyses showed that at low levels of time away, increasing time away was related to higher retention and greater Army career intentions. However as time away progresses, these effects are reduced and may in fact become negative. Indeed, while the number of deployments was positively related to reenlistment likelihood, the length of deployments was inversely related to reenlistment. Further, frequent, shorter deployments were associated with higher retention than fewer, longer deployments.

Increased perstempo was associated with greater family and financial strain. Greater time between deployments, command support and training, and family support activities were associated with increased retention, readiness, and quality of life, while conflict between job/personal responsibilities was negatively associated with such factors.

## The impact of operations tempo: Issues in measurement

Paper presented at the 42<sup>nd</sup> Annual Conference of the International Military Testing Association  
Edinburgh, United Kingdom

**Year** 2000

**Author(s)**

Castro, C. A.

Adler, A. B.

**Method** Survey of soldiers stationed in Europe

**Participants** 581 male and 104 female U.S. Army soldiers

### **Dependent Variables (outcomes)/ Measure / Source**

Family strain	Work-Family Conflict scale	Netemeyer et al., 1996
Unit readiness	Operational readiness scale	Vaitkus, 1994
Unit cohesion	Combat readiness scale	Podsakoff & MacKensie, 1994
	Horizontal cohesion scale	
	Vertical cohesion scale	
Leadership	General leadership quality scale	Vaitkus, 1994
Job satisfaction	Derived from Job Diagnostic Survey	Hackman & Oldman, 1975

### **Independent Variables (outcomes)/ Measure / Source**

Optempo	Daily workload (work hours per day; work days per week)	Developed by authors
	Training load (days spent on training in past 6 months)	
	Deployment load (number of deployments of 30 days or more)	
Receiving relevant information	Information flow scale	

### **Key Findings**

Having a clear operational definition of optempo is critical to assessing its effects on outcomes. For example, the authors have found that when optempo was defined as length of a deployment, longer deployments were associated with higher levels of psychological distress. However, when optempo was defined as having previous deployment experience, rates of psychological distress were lower. In this study, work hours and time deployed predicted work-family conflict, but training days did not. The interaction between days training and number of times deployed was significant, such that among soldiers with a high number of training days, those with deployment experience reported less work-family conflict than those without as much deployment experience. Training days was predictive of more positive combat readiness attitudes. Information flow (i.e., receiving adequate work-related information) and meaningful work moderated the impact of optempo on readiness. That is, having relevant work information and meaningful work attenuated the adverse impact of high optempo on readiness. These results highlight the importance of having a clear definition of optempo, and that different measures of optempo may be associated with adverse outcomes.

## **Deployments and Army personnel tempo**

*Rand Corporation, Arlington VA*

**Year** 2001

**Author(s)**

Sortor, R. E.

Polich, J. M.

**Method** Analysis of data collected by the Army on tempo from 1994-2000

**Participants** Army Active Component (reserve component not included)<sup>2</sup>

### **Independent Variables (predictors)/ Measure / Source**

Deployment tempo (from personnel records and unit records)

### **Key Findings**

Average deployment time increased substantially over time, by almost 30% from 1997 to 2000. The number of units deployed for 120 days or more per year has doubled since 1997. As well, the number of individual soldier days away for deployments doubled between 1994 and 1999. Combat arms branches experienced more time away than other types of units. However, during a given year most soldiers do not deploy at all and of those that do deploy, few are subject to repeat deployments. Therefore, the increase in deployment levels affect only a small proportion of the total force, Thus, looking at static measures of tempo, in terms of numbers affected by deployments, may not in itself reveal a tempo problem. Rather, the authors suggest that the tempo problem lies in overall workload (i.e., a combination of warfighting and the day-to-day demands during peacetime), as well as the dynamics of the entire system that must work to sustain the peacetime force and prepare and train for deployments. They conclude that the effects of tempo may not be due to the pace of the deployments themselves, but also to other factors that place stress on the military system (e.g., shortage of personnel, increasing workload). Overall force management may be more relevant to look at than individual soldier effects, so that the burden of deployments is evenly distributed and warfighting capabilities are sustained.

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<sup>2</sup> Total number of deployed units and individuals in the database varied from year to year and are specified in the paper.

## **Operations tempo: Preface to the special issue**

*Military Psychology*

**Year** 2005

**Vol** 17

**No** 3

**Pages** 131 to 136

**Author(s)**

Castro, C. A.

Adler, A. B.

**Method** Discussion of a model of optempo

### **Key Findings**

In this introduction to the special issue of *Military Psychology*, the authors present a model of the effects of optempo on soldiers and families, incorporating several stressors, moderators/mediators, and outcomes. Optempo is defined as "the pace of military operations," and includes the number and frequency of deployments, the number of days a soldier spends on training exercises, and the number of hours a soldier works each week. Stressors associated with optempo include garrison, training, and deployment. Moderators/mediators include soldier behaviours, leader behaviours, and organization behaviours. Outcomes include military performance, soldier health, retention, and family readiness.

## **Human dimensions of military operations: The construct of personnel tempo and its relationship with individual and organizational well-being**

*DRDC CORA TR 2006-29– Department of National Defence, Ottawa, Canada*

**Year** 2006

**Author(s)**

Dursun, S.

**Method** Literature review

### **Key Findings**

The purpose of this comprehensive review of the literature was to develop a conceptual and comprehensive model of PERSTEMPO in order to provide an effective way to describe how the demands of military service can impact individual, family and organizational well-being. Factors involved in this model are grouped under three categories of constructs: (1) predictors (i.e., various dimensions of personnel tempo); (2) intermediate factors (i.e., individual-level constructs such as functional coping strategies and hardiness; group level constructs such as leadership and group cohesion; organizational behaviours such as organizational policies and programs; and family characteristics such as family support and family well-being); and (3) outcomes (i.e., retention, military performance, and individual well-being). This model will allow for the understand of the impacts of military service on members, their families, and the organization, within a comprehensive framework.

## **Deployment Risk and Resilience Inventory: A collection of measures for studying deployment-related experiences of military personnel and veterans**

*Military Psychology*

<b>Year</b>	2006	<b>Author(s)</b>
<b>Vol</b>	18	King, D. W.
<b>No</b>	2	King, L. A.
<b>Pages</b>	89 to 120	Vogt, D. S.
		Knight, J.
		Samper, R. E.

**Method**      Development and testing of an inventory to assess risk and resilience factors for military personnel deployed to war zones/hazardous situations

### **Key Findings**

An instrument called the Deployment Risk and Resilience Inventory (DRRI) was developed, which contains 14 measures assessing aspects of deployment background, deployment-related experiences and perceptions, and post-deployment events and circumstances. The inventory is intended to assess deployment-related factors that can put military members and veterans at risk for developing symptoms of physical and/or mental illness.

The 14 constructs include: (a) two pre-deployment factors (prior stressors and childhood family environment); (b) 10 deployment or war-zone factors (preparedness, difficult living and working environment, concerns about life and family disruptions, deployment social support, general harassment, sexual harassment, perceived threat, combat experiences, aftermath of battle, and perceived nuclear, biological, and chemical [NBC] exposures); and (c) two post deployment factors (post deployment social support and post deployment stressors).

The authors stated that the survey, which has been used successfully in both mail and telephone format, is appropriate for most contemporary deployments. Psychometric properties of the scale (i.e., reliability, validity) were good, indicating that the scale may be useful for assessing the risk and resilience factors that can influence the impact of deployment on the physical and mental well-being of military personnel. Each of the measures in the DRRI may be used individually, separate from the whole scale, depending upon the needs of the researcher.

### 3.1.2 Stressors across the Deployment Cycle

#### American IFOR experience: Psychological stressors in the early deployment period

*U.S. Army Medical Research Unit - Europe*

**Year** 1996

**Author(s)**

**Pages** 1 to 5

Bartone, P. T.

**Method** Survey administered to soldiers prior to deploying; observations and interviews with soldiers during first 3 months of deployment (Croatia, Bosnia, Hungary)

**Participants** Pre-deployment survey: 3,036 U.S. soldiers stationed in Europe  
Mid-deployment interviews: 100 individual interviews, 174 group interviews, 196 consultations with leaders

#### Dependent Variables (outcomes)/ Measure / Source

Self-reported stressors

#### Independent Variables (predictors)/ Measure / Source

Time point in deployment cycle (pre- and early deployment)

#### Key Findings

The top stressors in the pre-deployment period included completing personal business before deploying, loss of educational opportunities, preparing family for deployment, being separated from friends and family, concern about Rear Detachment taking care of family, lack of job advancement opportunities, financial problems, problems with unit leaders, problems getting needed services from the Army, and family duties and responsibilities.

In the first month of deployment, during which there was intense activity and long work hours, the stressors reported were heavy workload, long hours, crowded and confined living quarters, poor sanitation of latrines and living areas, cold weather, frequent and lengthy meetings, family separation, isolation, mission ambiguity/uncertainty, poor communication, micromanagement, sleep loss, lack of exercise, and little recognition.

During the second month, when work schedules became more predictable, the main stressors reported were isolation, uncertainty/confusion about mission, lack of recognition, workload, boredom, lack of recreation/entertainment, lack of privacy, and doubts about the mission's importance.

In the third month, morale was higher and there was even more predictability in work schedules. The main stressors encountered were uncertainty about the mission, lack of recognition, isolation, doubts about mission importance, optempo/workload, limited recreation opportunities, lack of privacy, and boredom.

## **Post deployment support: Guidelines for program development**

*DND Sponsor Research Report 97-4*

**Year** 1997

**Author(s)**

Murphy, Maj P. J.

Gingras, Capt C.

**Method** Literature review, focus groups, and interviews

**Participants** 127 focus group participants (combination of service personnel and spouses); 26 interview participants (most involved in delivery of support services to personnel and their families)

### Key Findings

The report summarized the main issues that have emerged in previous research, outlined the major themes of the focus groups and interviews, and presented guidelines for a deployment support program. Results of the literature review indicated that deployment stressors might have a significant adverse impact on military personnel and their families. Further, it is acknowledged that, since stress begins before deployment and continues after homecoming, programs and interventions for the prevention and management of stress must consider the entire deployment cycle. The authors suggest that commanders have an important role to play in the management and prevention of stress throughout the deployment cycle. Focus group and interview results suggested the requirement for a specific post-deployment support program and the need to have a comprehensive policy of support throughout the stages of deployment. Several issues relating to deployment and service life arose, including dissatisfaction with the frequency and duration of deployments, and lack of time to spend with families. The authors suggest that these factors may be important in retention and should be addressed in policies and further research.

## **The psychological effects of peacekeeping service in Bosnia**

*New Zealand Army Headquarters*

**Year** 1998

**Author(s)**

Mirfin, Maj K. A.

**Method** Longitudinal study administered at four stages of deployment (pre-deployment, mid-deployment, post-deployment and follow-up)

**Participants** Experimental group: NZ Army personnel serving in Bosnia (Operation Radian II)  
Control groups: NZDF personnel deployed overseas on other than peacekeeping duties at the same time; NZ Army personnel who remained on duty in NZ during Op Radian II; civilians

### **Dependent Variables (outcomes)/ Measure / Source**

Depression

PTSD

### **Independent Variables (predictors)/ Measure / Source**

Stage of deployment

Group (Op Radian II vs. control groups)

Stress

List of daily hassles and deployment-related stressors

Level of confidence in pre-deployment training

Extent to which personnel felt settled into life upon return from deployment

Support from families

Education

### **Key Findings**

Levels of PTSD and depression increased across the stages of the study for Op Radian II respondents but not for the other groups, suggesting that these changes in symptomatology can be attributed to the deployment.

Symptoms of psychological distress at follow-up were predicted by a number of factors. Stress levels at mid-deployment and follow-up, confidence in pre-deployment training, extent of feeling settled back into life after the deployment, and satisfaction with support from family since the deployment, were all predictive of PTSD at follow-up for Op Radian II respondents. Education, stress levels at follow-up, feelings about amount of notice at pre-deployment, and feeling settled back into life after deployment, were all predictive of depression at follow-up for these respondents.

There were different stressors reported at each of the deployment stages. Stressors reported in the pre-deployment phase included problems with fellow workers and superiors, command issues, and family issues. During the mid-deployment phase, stressors included sex and intimacy, problems with fellow workers, lack of freedom, boredom, and rumours. Once they actually experienced deployment, respondents did not feel that pre-deployment training was adequate even if they were confident about it at the pre-deployment phase. In the post-deployment phase, stressors included problems with fellow workers and superiors, lack of information about the deployment, rumours, and personal adjustment issues. At follow-up, work issues were particularly important (e.g., workload).

For Op Radian II respondents, satisfaction with the Army was low at follow-up, and lower than for personnel deployed overseas on duties other than peacekeeping missions. Only one quarter of Op Radian II respondents were satisfied with the support they received from the Army during the deployment, although a higher proportion were satisfied with the support received since returning. Most Op Radian II respondents were satisfied with family support from the Army during the deployment. Most respondents thought that it was particularly important to have a post-deployment debrief, particularly on psychological and administrative matters.

Recommendations for future peacekeeping deployments included giving personnel an optimum amount of notice about deployment, having recreation activities in theatre, emphasizing the positive during deployments (e.g., the chance to help others), reducing the stress associated with the follow-up period, and providing information to families during deployments.

## Cohesion over time in a peacekeeping medical task force

*Military Psychology*

**Year** 2000

**Author(s)**

**Vol** 11

Bartone, P. T.

**No** 1

Adler, A. B.

**Pages** 85 to 107

**Method** Longitudinal study in which members were interviewed, surveyed, or observed at five time points during a six-month operation in Croatia:  
(1) pre-deployment (interviews, observations, surveys)  
(2) initial arrival and transition period just after deployment (interviews, observations)  
(3) two months into the deployment (interviews, observations)  
(4) halfway through the deployment (surveys, interviews, observations)  
(5) two weeks before mission completion (surveys)

**Participants** 188 Members of 502<sup>nd</sup> Mobile Army Surgical Hospital (MASH)

### Dependent Variables (outcomes)/ Measure / Source

Personal Morale	Single item	Developed by authors
Unit Morale	Single item	Developed by authors
Unit Cohesion	Single item	Developed by authors

### Independent Variables (predictors)/ Measure / Source

Stressors	List of common stressors including: personal and family health, getting ready for deployment, problem with co-workers, children, problems related to living in Europe, boredom	Developed by authors
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Time	Pre-deployment, mid-deployment, late deployment
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### Key Findings

Unit cohesion levels developed in a U-shaped pattern. Cohesion started low, increased for four months from pre-to mid-deployment, reached a high point around mid-deployment, and then decreased again toward the end of the operation. Further, military police, physicians, and communications workers reported the highest unit cohesion, whereas administrative personnel and operating room staff reported the lowest cohesion.

Influences on unit cohesion changed over the deployment cycle. In the pre-deployment phase, stressors in the home front and garrison environment (e.g., preparing to deploy, having to move one's family) showed the strongest negative correlations with unit cohesion. At mid-deployment, boredom and problems with coworkers and had the strongest negative effects on unit cohesion. At late deployment, boredom and problems with coworkers still contributed significantly to lower unit cohesion along with problems with

chain of command, and personal health problems.

Across the deployment cycle, unit cohesion was consistently correlated with unit morale, personal morale, ratings of unit's ability to perform the mission, confidence in mission success, satisfaction with rear detachment as well as confidence that one's family was being taken care of. In early deployment, confidence and trust in leaders had the strongest positive effects on cohesion. During the mid-deployment phase, confidence in fellow soldiers and mission success were more important in this respect. Confidence in leaders, and trust that families at home were being cared for, were the strongest predictors of cohesion in the late-deployment stage.

## Soldier dimensions and operational readiness in U.S. Army forces deployed to Kosovo

*U.S. Army Medical Research Unit -Europe, Walter Reed Army Institute of Research*

**Year** 2000

**Author(s)**

Castro, C. A.

Bienvenu, R. V.

Huffman, A. H.

Adler, A. B.

**Method** Surveys administered at five time points:  
 (1) pre-deployment (interviews, observations and completed surveys)  
 (2) just after arrival (interviews and observations)  
 (3) two months into deployment (interviews and observations)  
 (4) at approximate halfway point of deployment (interviews, observations, and surveys)  
 (5) two weeks prior to end of deployment (interviews, observations, and surveys)

**Participants** 1718 U.S. Army personnel deployed to Kosovo; 15 soldier and leader interviews

### Dependent Variables (outcomes) / Measure / Source

Morale	Morale Scale	Adapted from Bliese et al., 1998
Well-being	General Health Questionnaire (GHQ)	Goldberg, 1972
Depression	7 items adapted from CES-D Scale	Radloff, 1977
Physical health	Physical Health Questionnaire	Halverson et al., 1995
Attitudes about deployment scheduling	Ideal length and frequency of deployments	Developed by authors
Peacekeeping attitudes	11-item Peacekeeping Attitudes Scale	Developed by authors
Attitudes about operational readiness	3-item scale	Adapted from Marlowe et al. (1985) and Vaitkus (1994)
Attitudes about leadership	General Leadership Quality Scale	Adapted from Marlowe et al. (1985) and Vaitkus (1994)

### Independent Variables (predictors)/ Measure / Source

Workload	Days worked in past week; hours worked/day; hours of sleep/night in past week	
Deployment experiences	16-item scale	Developed by authors
Deployment stressors	9-item scale	Developed by authors
Deployment to Kosovo	Compared to Bosnia and Europe garrison	
Time	Pre- versus mid-deployment	

### **Key Findings**

Soldiers indicated that they preferred being deployed one to two times per three-year period. Further, a deployment length of five months was preferred. Data from previous studies of soldiers deployed to Bosnia and those in garrison (Europe and U.S.) were used for comparison (Castro & Adler, 1999a; Bliese, Escolas, Christ, & Castro, 1998). Top concerns in Kosovo were similar to those reported in a previous study with soldiers in Bosnia. These included uncertain redeployment date, boring and repetitive work, mines and unexploded ordinance, and family concerns. Soldiers in Kosovo reported four times as many traumatic events as soldiers deployed in Bosnia. As well, soldiers in Kosovo reported higher depression, less sleep, and high strain compared to those who did not experience traumatic events. Over the course of the Kosovo deployment, soldiers' attitudes about deployments became more negative. As well, morale and confidence in leadership were high, although confidence in leadership declined somewhat during the deployment. These findings suggest that peacekeeping deployments can impact soldier readiness across a number of dimensions, both positive and negative

## **A model of psychological adaptation in Peace Support Operations: An overview**

*Defence and Civil Institute of Environmental Medicine Technical Report 2001-050*

**Year** 2001

**Author(s)**

Thompson, M. M.

Gignac, M. A. M.

**Method** Model development

### **Key Findings**

The authors introduce the Peace Support Operations Adaptation Model (PSOAM), which details the adaptation process across the deployment cycle. The model incorporates individual, group, and organizational level variables at each stage of the deployment cycle that are important for adaptation. In the pre-deployment phase, factors that can affect adaptation include demographic variables (e.g., age, gender, occupation, rank), individual expectations, perceptions of support from others, government policies, and vertical and horizontal cohesion. The authors refer to these pre-deployment variables as “enabling or impedance factors” (i.e., factors that can facilitate adaptation or, conversely, make individuals more vulnerable to the effects of stressors) that can influence individuals’ deployment goals, as well as assessments of the self in terms of preparedness, motivation and risk. During deployment, factors such as perceptions of leader behaviours, group cohesion, and perceived adequacy of training may affect self-assessments of performance and ability to cope. In the post-deployment phase, variables that can affect adaptation include sense of personal and professional development, changes in relationships with others as a result of the peacekeeping experience, and level of unit cohesion.

## **Op Kinetic Task Force Kosovo quality of life update**

*Project Report PR 2003/19. Department of National Defence, Ottawa, Canada.*

**Year** 2003

**Author(s)**

Flemming, S

McKee, B.

**Method** Phase 1: focus groups, semi-structured interviews with commanders and service providers, surveys

Phase 2: focus groups, surveys

**Participants** Phase 1: > 200 CF members deployed to Macedonia and Kosovo (OP KINETIC)

Phase 2: 94 participants including married, common-in-law, single CF members and/or their spouses

### **Key Findings**

This objective of this research was to assess quality of life (QOL) among CF personnel deployed in Macedonia and Kosovo (OP KINETIC). This was accomplished in two phases. The first phase observed the pre-deployment period and QOL in-theatre whereas the second phase assessed the family support provided in Canada during deployment and the effectiveness of the post-deployment reintegration period. In the first phase, a significant minority of the personnel were dissatisfied with their military and in-theatre QOL during the mission as well as with the effectiveness of pre-deployment strategies undertaken prior to OP KINETIC, including training and pre-screening. Availability of communications between spouses and families was a major source of dissatisfaction, whereas basic living conditions were satisfactory. In the second phase, there was no clear consensus among spouses and personnel on what family support services should have been provided during and post-deployment. Some suggested that a standard education and/or counseling to support family reintegration should be implemented, whereas others suggested that family support services should begin prior deployment.

## The stressors and demands of peacekeeping in Kosovo: Predictors of mental health response

*Military Medicine*

<b>Year</b>	2004	<b>Author(s)</b>
<b>Vol</b>	169	Maguen, S.
<b>No</b>	3	Litz, B. T.
<b>Pages</b>	198 to 206	Wang, J. L.
		Cook, M.

**Method** Survey administered 2-3 weeks before deployment to Kosovo; follow-up phone interview 7 months after return

**Participants** 1132 active duty U.S. military personnel

### Dependent Variables (outcomes)/ Measure / Source

#### Pre- and post-deployment:

PTSD	PTSD Checklist	Weathers et al., 1993
Depression	6 items from Brief Symptom Inventory	Derogatis, 1975
Hostility	5 items from Brief Symptom Inventory	Derogatis, 1975
Alcohol use	Number of alcoholic drinks consumed per week (pre-deployment); alcoholic use in past month and questions about having a problem with alcohol (post-deployment)	
Unit cohesion and morale	6 items from Combat Readiness Morale Questionnaire	Gal & Manning, 1987

#### Pre-deployment:

Current stressors	Level of trouble/concern with 23 common stressors	Developed by authors
Life events	Life Events Checklist	Developed for use with Clinician-Administered PTSD Scale (Blake et al., 1995)

#### Post-deployment:

Military stressors	General Overseas Military Stressors Scale	Developed by authors
Negative experiences	Negative Aspects of Peacekeeping Scale	Developed by authors
Positive experiences	Positive Military Experiences Scale	Developed by authors
Traumatic events exposure	Potentially Traumatizing Events (PTE) Scale	Derived from Keane et al., 1989

## **Independent Variables (predictors)/ Measure / Source**

Time (pre- versus post-deployment)

### **Key Findings**

The most positive experiences of deployment included representing the U.S., feeling supported by fellow soldiers, and feeling that the mission was successful. In terms of general military stressors, being overseas for special events (e.g., holidays and birthdays) and being separated from family and friends on special days were reported as the most stressful experiences. Boredom was also a significant stressor.

The most negative experiences associated with deployment were the knowledge that many war criminals were not arrested, seeing children who were victims of war, and seeing civilians in despair. The most frequently potentially traumatizing events (PTEs) experienced included patrolling areas where there were mines, fear of having one's unit fired on, locating unexploded land mines, and seeing human remains.

Peacekeepers rated most of the PTEs less than moderately aversive. As a consequence, they did not exhibit high levels of psychopathology as a result of their experiences in Kosovo. In fact, higher levels of distress were evident at the pre-deployment compared to the post-deployment phase (i.e., at post-deployment, personnel exhibited lower rates of PTSD, lower PTSD and depression severity, and lower hostility, when pre-deployment levels of each of the aspects of distress, respectively, were statistically controlled). The authors suggest that these results illustrate that soldiers may experience anticipatory anxiety before being deployed, and consequently, relief upon return. Therefore, pre-deployment levels of stress symptoms may not represent a true baseline upon which to compare post-deployment levels. The authors also note that only a small percentage of individuals agreed to complete the post-deployment survey, which may have accounted for some of the differences in mental health symptoms between pre- and post-deployment (e.g., soldiers who did not complete the post-deployment survey may have been more concerned about the stigma of reporting mental health issues).

Symptoms of psychological distress and level of morale following the deployment were significant predictors of post-deployment hostility. Stress symptoms were predictors of post-deployment alcohol problems. Exposure to PTEs was a significant predictor of post-deployment depressive symptoms and PTSD symptomatology. That is, greater experiences of PTEs were associated with higher levels of symptoms. Post-deployment depressive symptoms were also associated with pre-deployment general life stressors (e.g., family and financial stressors).

### **Notes**

Controlled for history of traumatic events, general life stressors at pre-deployment, and baseline levels of the outcome variables.

### 3.1.2.1 Post-Deployment Reintegration

#### **Stress and coping with war: The experience of deployment and reunion for mortuary affairs units, reserve units, and first-term Army wives**

*Department of Psychiatry, Uniformed Services University of the Health Sciences, Bethesda, MD*

**Year** 1992

**Author(s)**

Norwood, A. E.

McCarroll, J. E.

Ursano, R. J.

Fullerton, C. S.

Rosenberg, F. R.

DeFraitess, R. F.

**Method** Questionnaires and interviews administered after deployment to the Persian Gulf

**Participants** 158 U.S. mortuary affairs soldiers; 108 non-mortuary affairs soldiers deployed to Persian Gulf (for comparison)

#### **Dependent Variables (outcomes)/ Measure / Source<sup>3</sup>**

Amount of stress felt

Social support

Symptoms of distress

Reactions to deployment and to the return home

#### **Independent Variables (predictors)/ Measure / Source**

Type of unit (mortuary affairs versus support occupations)

#### **Key Findings**

This volume presented preliminary data from soldiers at risk for psychological trauma (mortuary affairs) compared to non-mortuary affairs soldiers who had experienced somatic complaints and fears of having been exposed to disease or toxic substances during the Gulf War.

Many soldiers from the mortuary affairs units expressed fears that they would encounter the body of a friend or relative. At the height of the war, many reported intrusive thoughts about the bodies and attempted to avoid such thoughts at much higher rates than the non-mortuary affairs soldiers. When psychological distress symptoms were measured three to five months after their return, soldiers from mortuary affairs units reported much higher levels of distress. However, their functioning at this time was not impaired, and both groups reported similar levels of family issues as well as social support. Despite

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<sup>3</sup> Scale sources were not described.

the higher levels of psychological distress, mortuary affairs soldiers were more likely than non-mortuary affairs soldiers to be willing to perform the same duty again and to report that they had derived something positive from their experiences.

## **Post deployment status of CF personnel: Preliminary findings**

*DND Sponsor Research Report 00-8*

**Year** 1998

**Author(s)**

Murphy, Maj P. J.

Farley, Maj K. M. J.

**Method** Survey

**Participants** 202 CF personnel who had recently returned from deployment to Bosnia

### **Variables**

Homecoming issues (social support; relationships; health concerns; adaptation upon return to Canada; satisfaction with service in Bosnia)

Stress and strain (physical, behavioural, and psychological signs of strain; experience of serious incidents during deployment; PTSD)

Unit climate

The tour in perspective (perceptions of role effectiveness and use of force; suitability for peace support duties)

### **Key Findings**

Descriptive information was given in the report for the variables listed above. In terms of homecoming issues, less than one in ten respondents participated in welcome home parades, and less than a third reported that their family had held a party or celebration upon their return. These findings led to the suggestion that greater emphasis may need to be placed on homecoming as a means of social support. One in five experienced breakdown of relationships during the post-deployment period, and approximately the same proportion reported having experienced significant health concerns since their return. Over two-thirds reported some or considerable concerns adjusting to work and family. Overall, most members were satisfied with their service in Bosnia.

In terms of stress and strain, respondents indicated a gradual reduction in strain over the course of the deployment, followed by an increase in strain at post deployment. Significant numbers of individuals experienced traumatic events during deployment. Handling bodies and body parts, in particular, had a profound and lasting impact. Although none of the respondents met the researchers' defined cut-off scores for having PTSD, symptoms of PTSD were common.

Following deployment, measures of unit climate profile (morale, cohesion, and confidence in leadership) decreased, suggesting the need for competent leadership after deployment in order to prevent a decline in such factors. In terms of general issues concerning the tour, most members agreed that CF personnel are well suited to peacekeeping duties.

Overall, the data indicate that although most personnel were satisfied with the tour, a significant number had difficulties adjusting following the deployment.

**Notes**

Scales were not described in detail.

## **Psychometric assessment and refinement of the Homecoming Issues Inventory of the Human Dimensions of Operations (HDO) Project**

*Technical Report DCIEM TR 2000-068– Defence and Civil Institute of Environmental Medicine*

**Year** 2000

**Author(s)**

Thompson, M.

Pasto, L.

**Method** Psychometric assessment of a questionnaire

**Participants** 202 CF peacekeepers who had recently returned from a peace support operation in Bosnia.

### **Key Findings**

The objective of this report was to evaluate the psychometric properties of the Homecoming Issues Inventory (HCI). This inventory was designed by the Directorate of Human Resources Research and Evaluation (DHRRE) in support of the Human Dimensions of Operations (HDO) project and assesses aspects relevant to the homecoming experience of CF peacekeepers. First, factor analysis revealed that this inventory may be divided in three crucial homecoming-related subcomponents: (a) Homecoming Attitudes (HCA); (b) Homecoming Events (HCE); and (c) Homecoming Support (HCS). Further, reliability analyses revealed that the HCI and its subcomponents are psychometrically coherent and suggest validity of the HCA and HCS measures. Secondly, exploratory analyses of the homecoming attitudes and homecoming support measures with selected post-deployment outcomes (physical and psychological well-being, military stressors, and attitudes toward morale and leadership dimensions) led to several recommendations for each measure in order to enhance validity and reliability of these measures.

The development of a multidimensional measure of post-deployment reintegration: Initial psychometric analyses and descriptive results

*DRDC Technical Report 2003-142*

**Year** 2003

**Author(s)**

Blais, A. R.

Thompson, M. M.

Febbraro, A.

Pickering, D.

McCreary, D.

**Method** Survey

**Participants** 374 CF soldiers who had deployed to Afghanistan on Op Apollo, assessed 9 months after deployment

### **Dependent Variables (outcomes)/ Measure / Source**

Items assessing soldiers' perceptions regarding their ease or difficulty readjusting to personal, family, organizational, and community/cultural aspects of returning home (developed by authors). Items assessing both positive and negative aspects of post-deployment experiences were included.

### **Independent Variables (predictors)/ Measure / Source**

Demographic groups: marital status (married vs. single), having children or not, number of tours (one vs. two vs. three or more previous deployments), occupation category (combat vs. support or administrative)

### **Key Findings**

Although soldiers reported both positive and negative aspects of deployment, more positive than negative reintegration experiences were reported. That is, average scores for the items relating to positive reintegration experiences (e.g., "I have been more involved in my family relationships") were higher than the scores for items relating to negative experiences (e.g., "I feel a lower sense of accomplishment at work"). The highest positive scores were for family and cultural reintegration experiences, while the lowest were associated with post-deployment work roles.

Analyses were conducted to determine whether there were differences in the demographic variables of interest. Married soldiers reported more positive and negative reintegration experiences due to family issues compared to single soldiers, whereas single soldiers reported more positive and negative experiences related to work issues compared to married soldiers. Further, soldiers with children endorsed more positive and negative experiences than soldiers without children. Individuals in the combat arms endorsed more items regarding negative aspects of post-deployment work roles compared to those in support or administrative roles. Soldiers who were deployed for the first time reported higher levels of positive and negative experiences related to work and cultural reintegration compared to soldiers who had been deployed three or more times.

Overall, the results suggest that soldiers had relatively high levels of positive reintegration experiences and lower rates of negative experiences. The authors suggest that the negative scores associated with occupational reintegration indicate that work continues to be an issue following deployment, possibly because post-deployment work is perceived as less challenging and meaningful to soldiers.

#### Notes

The survey was administered nine months after returning from deployment. Given that this is a late stage in the reintegration process in which many negative reintegration issues may have already been dealt with, the authors note that the results may have yielded different results if soldiers were surveyed two to four months after returning.

## **Air Force post-deployment reintegration: A qualitative study**

*DRDC Toronto Technical Report 2005-159*

**Year** 2005

**Author(s)**

Sullivan-Kwantes, W.

Febbraro, A. R.

Blais, A. R.

**Method** Focus groups

**Participants** 95 Air Force (AF) personnel from seven Canadian Forces bases

### **Key Findings**

In this study, the reintegration issues experienced by AF personnel comprised personal, family, work, and cultural domains. In terms of personal reintegration, personnel reported increased self-confidence, self-awareness, empowerment, renewed sense of purpose, and the endorsement of positive coping skills. However, they also reported several negative changes such as anger and feeling disconnected from others. In terms of family, participants reported a renewed appreciation for their family, but also spoke of dealing with family breakdown, stresses on children, and problems in dealing with changes in family dynamics, roles, and routines. With respect to work reintegration, participants reported that the deployment had a positive effect on their career and commitment, but they also experienced negative effects such as lack of recognition for their efforts during deployment, organizational problems, and problems with medical and psychological follow-up. In terms of cultural reintegration, participants reported a new appreciation for life in Canada but felt a lack of support from the civilian community. Pre-deployment and deployment issues were also discussed, as well as unique issues experienced by augmentees, who often face additional challenges such as social isolation and lack of recognition. The authors indicate that the findings support previous research on reintegration in the CF and the US Army. In addition, the authors recommended a focus on: (a) the need for a standard post-deployment process; (b) pre- and post-deployment briefings for members and their families; (c) pre-deployment training; (d) enhanced family/rear-party support during deployment; (e) greater recognition and support from leaders; (f) leadership development and training; and (g) a review of organizational policies.

**Post-deployment reintegration measure: Psychometric replication and preliminary validation results**

*DRDC Toronto Technical Report 2005-277*

**Year** 2006

**Author(s)**

Blais, A.-R.

Thompson, M. M.

McCreary, D. R.

**Method** Survey

**Participants** 474 CF personnel who had recently returned from a peace support operation

**Dependent Variables (outcomes)/ Measure / Source**

Ease or difficulty readjusting to personal/cultural, family, and organizational aspects of returning home	Post-Deployment Reintegration Scale (PDRS)	Developed by authors
Concerns with military-related occupational stressors	Stress in Military Service Questionnaire (SMSQ)	Dobрева-Martinova, 1998b
Organizational commitment	Organizational Commitment Scale (modified)	Based on Gade, Tiggel, & Schumm, 2003
Coping	COPE Inventory (modified)	Based on Carver, Scheier, & Weintraub, 1989
Psychological distress	Symptoms Checklist (modified)	Based on Bartone, Ursano, Wright, & Ingraham, 1989

**Independent Variables (outcomes)/ Measure / Source**

N/A

**Key Findings**

In this report, the authors refined the reintegration measure and examined the relationships of reintegration scores with several aspects of personal and operational readiness and effectiveness. The number of scale items and subscales were reduced. Overall, CF members reported more positive than negative reintegration experiences. Correlation analyses indicated that feelings of loyalty and belonging to the Army were significantly associated with positive work reintegration experiences. Adverse personal, family, and work reintegration experiences were associated with avoidant coping, as well as physical and psychological symptoms. Work stressors were positively related to negative work reintegration experiences. Negative personal reintegration experiences were associated with higher levels of stress surrounding family and combat experiences. Unexpectedly, positive personal reintegration experiences

were related only to higher levels of combat-related stress, and were unrelated to any of the other stressors associated with military service. The authors note that although the correlations found speak to the validity of the reintegration scale, the direction of the relationships cannot be determined. That is, it is not clear whether reintegration experiences lead to symptoms, coping styles, or other factors, or conversely, whether military stress, coping styles, and symptoms lead to certain reintegration experiences.

### 3.1.3 Individual Effects

#### 3.1.3.1 Health and Well-Being

#### Psychological well-being and physical health symptoms of soldiers deployed for Operation Uphold Democracy: A summary of human dimensions research in Haiti

*Walter Reed Army Institute of Research*

**Year** 1995

**Author(s)**

Halverson, R. R.

Bliese, P. D.

Moore, R. E.

Castro, C. A.

**Method** Surveys, focus groups and interviews

**Participants** U.S. soldiers deployed to Haiti (surveys:  $n = 3,205$ ; focus groups/interviews:  $n = 267$ )

#### **Dependent Variables (outcomes)/ Measure / Source**

Psychological well-being      Deployment Assessment Questionnaire<sup>4</sup>      Walter Reed Army Institute of Research

Physical health symptoms      Deployment Assessment Questionnaire      Walter Reed Army Institute of Research

Personal experiences in Op Uphold Democracy      Written comments

#### **Independent Variables (outcomes)/ Measure / Source**

Location      Used comparison data sets from soldiers deployed to Operation Desert Shield (Persian Gulf), Operation Restore Hope (Somalia), Operation Vigilant Warrior (Kuwait), and a non-deployed soldier sample

Rank

Time in company

Age

Gender

Marital status

Number of children

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<sup>4</sup> Includes the Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982).

**Key Findings**

Overall, soldiers deployed to Haiti did not report high levels of psychological distress or physical health symptoms. Psychological symptoms were lower than those deployed to Somalia or the Persian Gulf, and were similar to the non-deployed sample, whereas the number of physical symptoms did not vary across location. Lower ranks experienced higher levels of psychological and physical distress than more senior-ranking soldiers. Psychological distress was higher among infantry soldiers compared to those in other types of units.

When rank was controlled, there were no significant differences in psychological or physical health based on length of time in the company, age, gender, marital status, or number of children.

However, a sub-sample of the soldiers reported high psychological and physical health symptoms. Factors that affected these soldiers' well-being included operational environment (e.g., poor sanitation, lack of privacy, heat, fear of disease), family separation (especially for members who missed the birth of a child or had been deployed multiple times), unit and work issues (e.g., quality of leadership, workload, performing tasks not specifically trained for), and policy issues (e.g., ambiguity and changes in return date; belief in the value of the operation).

## Post-traumatic stress disorder symptoms among Gulf War veterans

*Military Medicine*

**Year** 1996

**Vol** 161

**No** 7

**Pages** 407 to 410

**Author(s)**

Stretch, R. H.

Marlowe, D. H.

Wright, K. M.

Bliese, P. D.

Knudson, K. H.

Hoover, C. H.

**Method** Survey

**Participants** Active duty and reserve veterans from Pennsylvania and Hawaii who either deployed ( $n = 1,524$ ) or did not deploy ( $n = 2,727$ ) to the Persian Gulf

### Dependent Variables (outcomes)/ Measure / Source

PTSD symptoms

Impact of Event Scale

Horowitz, Wilner, & Alvarez, 1979

Psychological distress

Brief Symptom Inventory

Derogatis, 1975

### Independent Variables (predictors)/ Measure / Source

Deployment status

### Key Findings

Overall, deployed personnel exhibited significantly higher rates of psychological distress than non-deployed individuals. The prevalence rate for PTSD symptoms was slightly higher for reserve veterans than for active duty veterans. The authors suggested that lack of psychological preparation might have been a factor that accounted for the elevated symptoms among reservists.

## **The impact of deployment length on soldier morale, cohesion, and mental health**

*U.S. Army medical Research Unit -Europe, Walter Reed Army Institute of research*

**Year** 1998

**Author(s)**

**No** 26

Castro, C. A.

**Pages** 1 to 2

**Method** Surveys administered 1-3 months prior to deployment, during deployment, and one month after returning to Germany

**Participants** Morale and cohesion measured in over 6,000 soldiers of units deployed for Operation Joint Endeavor; mental health screen completed by over 46,000 soldiers

### **Dependent Variables (outcomes)/ Measure / Source**

Alcohol abuse	Mental health screening	Joint Medical Surveillance Program
Depression	Mental health screening	Joint Medical Surveillance Program
PTSD	Mental health screening	Joint Medical Surveillance Program
Unit Cohesion	1 item rated low, moderate or high	
Morale	1 item rated low, moderate or high	

### **Independent Variables (predictors)/ Measure / Source**

Length of deployment

Time (prior, during and after deployment)

### **Key Findings**

Mental health, morale, and perceptions of unit cohesion all changed as a result of deployment, with the changes occurring after being deployed for five to six months. Morale decreased during the deployment and increased dramatically after members returned to Germany. Unit cohesion did not significantly change between pre- and during deployment, but did improve after return to Germany. Having a lengthier deployment was predictive of increased PTSD, depression, and alcohol abuse, with the first increase occurring at 5-6 months into the deployment.

The authors suggest that these findings support a tour length of four to six months to reduce the adverse impact of deployment on mental health.

## **The long term effects of Operation Desert Storm on the psychological well-being of U.S. Army Reserve and National Guard Veterans**

*Journal of Applied Social Psychology*

**Year** 1998

**Author(s)**

**Vol** 28

Stuart, J.

**No** 1

Bliese, P. D.

**Pages** 1 to 22

**Method** Survey

**Participants** 1,156 members of the Army National Guard and 739 members of the Army Reserve who served either in the Persian Gulf, the U.S., or Germany

### **Dependent Variables (outcomes)/ Measure / Source**

Psychological distress

Global Severity Index

Derogatis & Melisaratos, 1983

### **Independent Variables (predictors)/ Measure / Source**

Deployment location (Persian Gulf, U.S., or Germany)

### **Key Findings**

Elevated symptoms of psychological distress were found for the veterans of the Persian Gulf, but not for those who served in the U.S. or Germany. Current stressors or demographic characteristics could not explain these results, since these variables were controlled in the analysis. Self-reported exposure to petrochemical fires in Kuwait and degree of concern with these events were associated with symptoms beyond the effects of combat-related stressors.

## **Stress and health during medical humanitarian assistance missions**

*Military Medicine*

**Year** 1999

**Author(s)**

**Vol** 164

Britt, T. W.

**No** 4

Adler, A. B.

**Pages** 275 to 279

**Method** Surveys administered before and during deployment

**Participants** Personnel deployed to a medical humanitarian assistance mission in Kazakstan

### **Dependent Variables (outcomes)/ Measure / Source<sup>5</sup>**

Depression

Physical symptoms

### **Independent Variables (predictors)/ Measure / Source**

Stress

Coping

### **Key Findings**

Team members underestimated how much stress they would experience on the deployment. The stressors that were underestimated mainly revolved around feelings of being in an austere and isolating environment and not being able to effect enough change in the local conditions. Although team members appreciated the immediate effect they were having, many were worried that their efforts would not be enough to change the conditions that existed on a more permanent basis. Team members did not use high levels of adaptive coping strategies (e.g., exercise, dealing with problems directly). Instead, they showed elevations in alcohol and cigarette consumption. However, despite these negative experiences, reports of depression and physical symptoms did not increase during the deployment. The authors explain that the latter may have been a function of members feeling that they were involved in important and relevant work during the humanitarian operation, such that they were motivated to work despite the conditions.

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<sup>5</sup> Sources of the scales were not described.

## **Relationships between substance use and recent deployments among women and men in the military**

*Military Psychology*

**Year** 2000

**Vol** 12

**No** 3

**Pages** 205 to 220

**Author(s)**

Federman, E. B.

Bray, R. M.

Kroutil, L. A.

**Method** Survey

**Participants** 16,193 U.S. military personnel

### **Dependent Variables (outcomes)/ Measure / Source**

Substance use (cigarette smoking, alcohol use, alcohol dependence, illicit drug use)

### **Independent Variables (outcomes)/ Measure / Source**

Deployment status in past 30 days (any days versus no days deployed)

Length of deployment

Stress experienced on deployment

Recency of deployment

### **Key Findings**

The study demonstrated that even after controlling for demographic differences (i.e., age, race/ethnicity, education, marital status, branch of service, and pay), deployed military personnel were more likely to have higher rates of substances use compared to those who were not deployed. The specific types of substances used differed between men and women. Indeed, for women, deployment was associated with higher rates of heavy alcohol use, whereas for men, deployment was associated with higher rates of cigarette smoking, alcohol dependence, and both non-heavy and heavy alcohol use. Deployment was not associated with illicit drug use in either men or women. The relationship between deployment and substance use was higher for those who experienced stress during deployment and those who deployed for longer periods. There was no effect of recency of deployment, indicating that the association between deployment and substance use did not attenuate over time.

Notes

The data comes from the 1995 DoD Survey of Health Related Behaviors Among Military Personnel. More in-depth details of the methods and measures used are provided in Bray, Kroutil, Wheelless et al. (1995).

# The impact of deployment history on the well-being of military personnel

U.S. Army Medical Research Unit - Europe

**Year** 2000

**Author(s)**

Huffman, A. H.

Adler, A. B.

Castro, C. A.

**Method** Primary psychological screening survey prior to returning to home station; secondary screening surveys and interviews conducted if mental health scores exceeded criteria on the clinical scales

**Participants** U.S. Army personnel ( $n = 57,854$ ) re-deploying from NATO mission in the former Yugoslavia

## Dependent Variables (outcomes)/ Measure / Source

PTSD	PTSD checklist	U.S. Army Medical Research Unit-Europe
Depression	Zung Self-Rating Depression Scale	Zung et al., 1993
Alcohol abuse symptoms	CAGE Questionnaire	Ewing, 1984

## Independent Variables (predictors)/ Measure / Source

Length of deployment

Number of previous Bosnia deployments

## Key Findings

Lengthier deployments were associated with greater psychological distress. For personnel who had been on at least two Bosnia deployments, rates of depression and PTSD were lower than those who had been on only one deployment. However, this was only the case if the deployments lasted six months or less. Deployment history was not associated with rates of alcohol abuse. Thus, longer deployments were associated with lower well-being, while having previous deployment experience was associated with greater well-being if the deployments were not lengthy.

## Key predictors of post-trauma symptomatology in military peacekeeping veterans

*Doctoral Thesis, Macquarie University, Australia*

**Year** 2002

**Author(s)**

Hodson, S. E.

**Method** Surveys

**Participants** Study 1: 246 Australian Defence Force peacekeepers surveyed after their return from duty in Rwanda

Study 2: Part 1: 171 ADF personnel four months after return from Rwanda; 67 three years after return (66 matched cases from both time points); Part 2: 118 personnel at six years post-deployment, a subset of whom were matched at the four month and three year time points

Study 3: 117 personnel six years after return from Rwanda

### **Dependent Variables (outcomes)/ Measure / Source**

General Mental Health	General Health Questionnaire – 12 (GHQ-12)	Goldberg, 1972
PTSD symptoms	Impact of Events Scale	Horowitz, Wilner, & Alvarez, 1979

### **Independent Variables (predictors)/ Measure / Source**

Level of trauma exposure	Traumatic Stress Exposure Scale (TSES)	Based on Green (1990)
Social support	Crisis Support Questionnaire	Joseph et al., 1992
Loneliness	UCLA Loneliness Scale	Russell et al., 1980
Lifetime trauma exposure <sup>6</sup>	Traumatic Life Events Questionnaire (TLEQ)	Kubany et al., 2000
Alcohol use <sup>4</sup>	AUDIT	World Health Organisation

### **Key Findings**

The first study looked at the effects of social support and loneliness on post-trauma symptoms. Consistent with previous research, the majority of the sample did not report significant PTSD symptomatology and were effectively coping with the exposure to potentially traumatic events. However, a small group reported high levels of distress, with 13% of the sample reporting clinical level symptomatology. The sample exhibited elevated levels of psychological distress (as measured by the GHQ) compared to the general population as well as to those returning from a more recent peacekeeping mission. Low social support predicted higher PTSD symptoms. The positive effect of social support on PTSD symptoms was

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<sup>6</sup> Included in Study 3 only.

mediated by perceptions of loneliness. That is, high social support was negatively related to loneliness, which was in turn positively related to greater symptoms of PTSD. There was a significant but low correlation between level of traumatic exposure and PTSD symptoms and also a lack of relationship between level of traumatic exposure and loneliness. The authors suggest that these findings are consistent with the argument that after several months of stressor exposure, the level of exposure becomes less important than the distress and neurobiological changes generated by the symptoms.

The second study investigated the relationship between level of traumatic exposure and psychosocial factors, measured four months after deployment, with chronic posttraumatic distress three and six years post deployment. PTSD symptoms increased, although not significantly, over the three year period. Level of traumatic exposure and posttraumatic symptomatology predicted distress at three years. Once again, perceptions of loneliness at four months mediated the effects of social support on symptoms. As well, at three years, there was a significant relationship between perceptions of loneliness and posttraumatic symptoms. In the second part of this study, it was found that PTSD symptoms increased significantly from four months to six years. This increase may be at least partially explained by an increase in the reporting of traumatic experiences. The potential instability of reporting of traumatic events has been previously documented in the literature.

The author suggests that there are two potential pathways to posttraumatic symptoms. In the first path, lack of connection with support (i.e., high support combined with high loneliness) leads to greater feelings of dissatisfaction with social networks and subsequent symptomatology, while in the second path accessing support may trigger increased processing of traumatic material, which in turn leads to increased symptomatology.

The third study examined whether Rwanda-related symptoms and predictive variables of such symptoms at six years after the deployment might be due to confounding effects of being exposed to other potentially traumatic events. In this regard, it was found that exposure to other potentially traumatic events across the lifetime did not confound the reporting of chronic symptomatology from a peacekeeping mission. High levels of alcohol use were found in this group. This hazardous drinking was not well explained by traumatic exposure or feelings of loneliness. Being subsequently deployed (after Rwanda) was not associated with increased symptomatology. However, participants who had discharged from the military did show significantly more symptomatology than serving personnel.

## Psychological adjustment of Navy mothers experiencing deployment

*Military Psychology*

**Year** 2002

**Vol** 14

**No** 3

**Pages** 199 to 216

**Author(s)**

Kelley, M. L.

Hock, E.

Jarvis, M. S.

Smith, K. M.

Gaffney, M. A.

Bonney, J. F.

**Method** Interview before deployment; Questionnaires administered at pre- and post-deployment

**Participants** 48 mothers who deployed and 72 mothers who were not deployed

### Dependent Variables (outcomes)/ Measure / Source

Social Support	Scored questions (interview)	Defined by authors
Maternal Role	Maternal Role Investment Scale	DeMeis et al., 1986
Stress Perception	Perceived Stress Scale	Cohen et al., 1983
Anxiety	Self-report questionnaire	Kremen, 1990
Depression	CES-D	Radloff, 1977

### Independent Variables (predictors)/ Measure / Source

Intention to reenlist	Question in interview	Described by authors
Length of separation	Days away from youngest child in past year	
Deployment status (deployed versus not deployed)		
Time (pre- versus post-deployment)		
Marital status <sup>7</sup>		

### Key Findings

Single deployed mothers reported higher levels of depressive symptomatology than married deployed mothers or single non-deployed mothers. Deployed single mothers reported more anxiety than non-deployed single and deployed married mothers. Surprisingly, non-deployed married mothers reported levels of anxiety similar to those experienced by deployed single mothers. The authors indicate that this

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<sup>7</sup> Of the total sample, 56% were married and 44% were single. The percentages of married and single mothers in the deployed and non-deployed groups were not provided.

may be because when they are not deployed, married mothers experience significant role overload since they must balance household and childcare responsibilities with work. When they are deployed, the spouse remaining at home is able to shoulder some of the burden of family responsibilities.

For the deployed mothers, psychological well-being scores did not vary over time between the pre- and post deployment periods. Although it was expected that psychological well-being among all mothers would increase when the member returned, the authors noted that the “honeymoon period” following deployment is brief and in fact may have dissipated by the time members were interviewed. As well, women in the deployment condition remained on sea assignment after the deployment, so well-being may have remained stable since some members may have been preparing to depart again.

Predictors of depressive symptoms included low support from the child’s father, fewer years of military service, and greater length of most recent separation. Support from friends was the strongest predictor of anxiety, in that having a high level of support was associated with lower anxiety.

## **PERSTEMPO and HDDS: Service provider interview and focus groups findings**

*DRDC CORA Technical Memorandum 2006-04 – Department of National Defence, Ottawa, Canada*

**Year** 2003

**Author(s)**

Dunn, J.

Ford, K.

Flemming, S.

**Method** Focus group and interviews

**Participants** 107 service providers (i.e., social workers, psychiatrists, psychologists and counselors, medical doctors, nurses, Military Family Resource Centre (MFRC) staff and volunteers, as well as padres) during site visits to 17 Canadian Forces Bases/Wings/Units and five International Operational Theatres throughout 2001.

### **Key Findings**

This study is part of the Perstempo and Human Dimensions of Deployments Study (HDDS), the aim of which is to understand the consequences of increased perstempo and deployments, for members of the CF, their families, and the organization. The report summarized service providers' perceptions of personnel tempo in the CF. Although problems with the delivery and availability of services, most service providers believed that the CF was working toward addressing these issues. It was felt that problems associated with high perstempo could be dealt with by increasing the number of CF personnel. Otherwise, a continually high workload may lead to more members burning out and having to resort to stress and medical leave in order to cope with high stress levels. Although many issues related to perstempo were mentioned (e.g., stress, PTSD), family was the most frequently discussed area of concern. It was felt that family support has declined, and that it is difficult for members to justify time away and heavy workloads to their families. Not only does this study provide a better understanding of service providers' own perstempo, it also depicts their perspective on perstempo in the CF as well as their understanding of its impacts on military members and their loved ones.

## **Canadian Forces and operational stress injuries: Efforts and progress in addressing the issues**

*Contractor's Report 2004-02-Department of National Defence, Ottawa, Canada.*

**Year** 2004

**Author(s)**

L'Heureux, L.N.,

Rochon, C

**Method** Telephone and E-mail contacts; document review and internet searches within the Department of National Defence (DND) and the CF; the Human Rights Act; the Canadian Charter of Rights and Freedoms; media clippings; and electronically available information from other military and para-military organizations, such as police forces and fire-fighting departments.

**Participants** CF personnel involved in key roles with respect to efforts to understand and address OSIs within the CF.

### **Key Findings**

This report discusses CF efforts and progress addressing issues related to stigma surrounding operational stress injuries (OSIs). The telephone discussions pointed to four broad themes: (1) contextual shifts related to OSIs (e.g., increased diversity, downsizing, shift in deployment context); (2) the need for a consensual definition of OSIs within the CF and medical professions; (3) the duty to accommodate CF personnel with OSIs (lack of specific rules and limited options to accommodate members with OSIs); and (4) CF efforts to address OSI issues (e.g. Operational Trauma and Stress Support Centers (OTSSCs)) and the need to evaluate the effectiveness of these interventions and to better coordinate policies and activities with respect to OSIs. Consequently, several observations and recommendations were made. Many of these are related to the establishment of a central OSI committee mandated to oversee the establishment and functioning of local sub-committees, which would design and deliver localized OSI initiatives. Additional recommendations are presented relating to the duty to accommodate and to ensuring that problems related to operational stress are seen as leadership issues that must be addressed in a systematic and integrated way.

# Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care

*New England Journal of Medicine*

<b>Year</b>	2004	<b>Author(s)</b>
<b>Vol</b>	351	Hoge, C. W.
<b>No</b>	1	Castro, C. A.
<b>Pages</b>	13 to 22	Messer, S. C.
		McGurk, D.
		Cotting, D. I.
		Koffman, R. L.

**Method** Survey

**Participants** Members of four U.S. combat infantry Army and Marine units before deployment to Iraq ( $n = 2,530$ ) or 3-4 months after return from combat duty in Iraq or Afghanistan ( $n = 3,671$ )

## Dependent Variables (outcomes)/ Measure / Source

Use of professional mental health services and barriers

Alcohol Problems Self-reported (mild, moderate or severe)

PTSD PTSD Checklist Blanchard et al., 1996; Weathers et al., 2004

Major Depression Patient Health Questionnaire Spitzer et al., 1999

Generalized Anxiety Disorder Patient Health Questionnaire Spitzer et al., 1999

## Independent Variables (predictors)/ Measure / Source

Combat Duty Reported combat experience and frequency of contact

Location Iraq versus Afghanistan

Time Pre- versus post-deployment

## Key Findings

Frequency of contact with the enemy and rates of combat experience (e.g. engaging in a firefight) were higher for soldiers in Iraq compared to Afghanistan. For all groups following deployment, there was a strong association between reported combat experiences (e.g., being shot at, handling dead bodies, killing enemy combatants), and being wounded or injured as well as with the prevalence of PTSD. There were also significant associations of deployment experiences with depression and misuse of alcohol.

Soldiers who returned from Iraq were more likely to report mental health problems (major depression, generalized anxiety disorder, and PTSD), to express interest in receiving help, and to use mental health services compared to those returning from Afghanistan or those surveyed before deploying. Less than half of those who met the criteria for mental disorders received or wanted to receive professional help. Concerns about being stigmatized and about barriers to accessing and receiving mental health services were greatest in those that met the screening criteria. The study highlighted the importance of reducing stigma as a barrier to care in a population at such high risk for psychological disorders.

## **Self-rated health and subsequent health care use among military personnel returning from international deployments**

*Military Medicine*

<b>Year</b>	2004	<b>Author(s)</b>	
<b>Vol</b>	169		Trump, D. H.
<b>No</b>	2		Brady, P. J.
<b>Pages</b>	128 to 132		Olsen, C. H.

**Method** Survey

**Participants** 16,142 U.S. Army and Air Force personnel returning from deployment to Europe or Southwest Asia; data from the Defense Medical Surveillance System

### **Dependent Variables (outcomes)/ Measure / Source**

Hospitalization, separation from military service, and number of outpatient visits at 6 months following the deployment

### **Independent Variables (predictors)/ Measure / Source**

Self-rated general health following deployment

### **Key Findings**

Upon returning from deployment, 14% of the sample reported at least one health condition or health-related concern. Within six months following the deployment, 1.4% were hospitalized, 25% made five or more outpatient visits, and 4% separated from the military. Self-reported health status was associated with health outcomes, in that individuals with fair/poor self-rated health were at a higher risk for high use of outpatient services, although not for hospitalization. However, military personnel with health concerns or problems were not more likely to leave military service during the six months following deployment. The authors noted that self-rated low health status might help to identify individuals who have higher health care needs following deployments in the future.

## **The impact of deployment length and experience on the well-being of male and female soldiers**

*Journal of Occupational Health Psychology*

**Year** 2005

**Author(s)**

**Vol** 10

Adler, A. B.

**No** 2

Huffman, A. H.

**Pages** 121 to 137

Bliese, P. D.

Castro, C. A.

**Method** Survey and semi-structured interview

**Participants** 2,114 men and 1,225 women in the U.S. Forces 30 days before redeploying to their home station

### **Dependent Variables (outcomes)/ Measure / Source**

PTSD Post-Traumatic Stress Scale Bartone et al., 1994; Castro et al., 1999

Depression Zung Self-Rating Depression Scale Zung et al., 1993

### **Independent Variables (predictors)/ Measure / Source**

Deployment frequency Number of times deployed to the Balkans

Deployment length Number of months of current deployment

### **Key Findings**

Overall, lengthier deployments and being deployed for the first time were associated with increased distress. However, when examined separately by sex, the relationship between deployment length and symptoms of PTSD and depression was significant only for men.

For men, having had a previous deployment was associated with lower levels of depression and PTSD, but having a previous deployment was not related to these variables among women. The differences in the correlations of deployment experience and well-being for men and women were not significant.

### **Notes**

Controlled for rank, marital status, and unit type. Analyses were restricted to non-combat arms units, since only men occupied combat arms units.

## **PERSTEMPO qualitative data: CF member focus group findings**

*ORD Technical Report TR 2005/09 – Department of National Defence, Ottawa, Canada*

<b>Year</b>	2005	<b>Author(s)</b>
		Dunn, J.
		Ford, K.
		Flemming, S.

**Method** Focus groups

**Participants** 214 focus groups conducted among 2,136 CF members during site visits to 17 Canadian Forces Bases/Wings/Units and five operational theatres (Bosnia-Herzegovina, Golan Heights, Europe, Arabian Gulf, and Eritrea) during 2001

### **Key Findings**

This study represents the qualitative phase of the Perstempo and Human Dimensions of Deployments Study (HDDS), which was initiated in response to concerns about the increasing workload and operational tempo of Canadian Forces members. The aim of the focus groups was to gain insight into members' perspectives on perstempo and to understand the impacts of perstempo on members, their loved ones, and the organization.

Throughout the focus groups, emphasis was consistently placed on the CF's shortage of personnel, equipment, and resources. Potential repercussions identified were increased member burnout, physical and mental fatigue, attrition, and family problems. It was unclear, however, which aspects of perstempo had the greatest impact on members (e.g., deployment load, work hours, or some combination of variables). However, despite the negative comments, positive findings also emerged. For example, members felt that CF personnel were among the best trained military members in the world. While some members indicated that they were motivated by a high perstempo environment, others found high perstempo to be detrimental. It was clear from the comments that a balance between high perstempo and down-time was essential for members' well-being. The authors suggested that identifying a healthy level of perstempo will be beneficial both to the organization and to the quality of life of individual members.

**Physical health symptoms in peacekeepers: Has the role of deployment stress been overrated?**

*Stress, Trauma, and Crisis: An International Journal*

<b>Year</b>	2005	<b>Author(s)</b>
<b>Vol</b>	8	Norris, R. L.
<b>No</b>	4	Maguen, S.
<b>Pages</b>	251 to 265	Litz, B. T.
		Adler, A. B.
		Britt, T. W.

**Method** Surveys completed 4-6 weeks prior to deployment to Bosnia-Herzegovina, and post-deployment interviews conducted by telephone 12-18 months after deployment

**Participants** 198 U.S. Peacekeepers (133 active duty and 65 reserve military personnel)

**Pre-deployment measures:**

Current Stressors	27-item scale	Developed by authors
Exposure to traumatic events	Brief Lifetime Trauma Scale	Developed by authors
Physical health	Health Symptom Checklist (HSC)	Bartone et al., 1989
PTSD	USAMRU-E PTSD Scale	Bartone et al., 1994; Castro & Adler, 1999b

**Post-deployment measures:**

PTSD	PTSD Checklist	Weathers et al., 1993
Physical health	Health Symptom Checklist	Bartone et al., 1989
Military stressors	General Overseas Military Stressors scale	Developed by authors
Negative aspects of peacekeeping	Negative Aspects of Peacekeeping Scale	Developed by authors
Positive aspects of military service	Positive Military Experiences Scale	Developed by authors
Exposure to combat stress	Potentially Traumatic Events Scale	Developed by authors

**Key Findings**

Physical health symptoms were examined prospectively in a sample of peacekeepers. At the pre-deployment examination, general life stressors and pre-deployment stress symptoms were significant predictors of physical health. Stress symptoms (i.e., symptoms of PTSD) reported before and after the mission, and pre-existing physical health symptoms, were predictors of post-deployment physical health.

Mission-related stressors (i.e., stressful experiences during deployment) were not directly associated with physical health outcomes.

Stress symptoms mediated the relationship between exposure to traumatic events and physical health symptoms. That is, traumatic events influenced physical health complaints indirectly, through their effects on stress symptoms. Of the PTSD symptom clusters, hyperarousal had the strongest relationship with physical health.

## **The Canadian Persian Gulf cohort study: Detailed report.**

*Prepared by Statistics Canada for the Gulf War Veterans Cohort Study Advisory Committee*

**Year** 2005

**Method** National mortality and cancer incidence data used to determine whether Canadian Gulf and Kuwait War veterans had a higher risk of death or cancer compared to other Canadian veterans of the same era. Data was tracked for nine years.

**Participants** CF members deployed to the Gulf and Kuwait War of 1990/91 (n = 5,117); non-deployed comparison sample (n = 6,093)

### **Dependent Variables (outcomes)/ Measure / Source**

Occurrence of cancer

Occurrence of death

### **Independent Variables (predictors)/ Measure / Source**

Deployment status

### **Key Findings**

There was no significant difference between the deployed and non-deployed groups in overall risk of death. Deployed individuals were more likely to die from airspace crashes, although the authors explain that this was likely due to the greater number of members in flying occupations in the deployed sample. There were no differences in risk of death from other causes (suicide, motor vehicle crashes). There were also no significant differences in cancer risk. It was suggested that the lack of differences could be due to the small number of events in specific disease categories. In comparison to the general population, the veterans had lower rates of mortality, possibly because military service excludes individuals with serious chronic illnesses. Rate of cancer did not vary from the general population. The authors indicate that the results are in line with other studies on the health of Gulf War veterans in other countries. Although Canadian Gulf War veterans did report higher rates of symptoms and common illnesses than other veterans of the same era, they did not appear to be at greater risk of death or cancer.

**The health of UK military personnel who deployed to the 2003 Iraq war: a cohort study**  
*Lancet*

**Year** 2006  
**Vol** 367  
**Pages** 1731-1741

**Author(s)**  
Hotopf, M.  
Hull, L.  
Fear, N.T.

**Method** Questionnaires

**Participants** 4,722 UK armed forces personnel deployed in Iraq in 2003 and 5,550 non-deployed

**Dependent Variables (outcomes)/ Measure / Source**

Health Perception	General Health Questionnaire (GHQ-12)	Goldberg & Williams, 1988 Goldberg et al., 1997
	36-item Short Form Health Survey (SF-36)	Ware & Sherbourne, 1992
PTSD	17-item National Center for PTSD Checklist – Civilian version	Blanchard et al., 1996
Fatigue	Chalder Fatigue Scale	Chalder et al., 1993

**Independent Variables (outcomes)/ Measure / Source**

Deployment status (deployed vs. non-deployed); Enlistment status (regular vs. reservist)

**Key Findings**

Health outcomes of military personnel who had deployed to the Iraq war were compared with those of personnel who were not deployed. Slight differences in health outcomes emerged between the deployed and non-deployed groups. In particular, there was a modest increase in the number of individuals with multiple physical symptoms in the deployed group. No other differences between the groups were found. The effect of deployment on health outcomes varied as a function of enlistment status. Specifically, for reservists, deployment was associated with mental disorders and fatigue, whereas for regular force members, deployment was only weakly associated with multiple physical symptoms. Later deployments, which involved higher levels of insurgency and UK casualties, were not associated with poorer health outcomes. The authors conclude that deployment appears to have adverse health effects for reservists, while regular force personnel are less affected.

## **Mental Health Advisory Team (MHAT) IV. Operation Iraqi Freedom 05-07. Final report**

*Office of the Surgeon Multinational Force-Iraq and Office of the Surgeon General United States Army Medical Command*

**Year** 2006

**Method** Soldier and Marine Well-Being Survey adapted from the Land Combat Study of the Walter Reed Army Institute of Research (Castro & Hoge, 2002); focus groups

**Participants** U.S. Soldiers ( $n = 1,320$ ) and Marines ( $n = 447$ ) from Operation Iraqi Freedom

### **Dependent Variables (outcomes)/ Measure / Source<sup>8</sup>**

Behavioural health status

Mental health (depression, anxiety, PTSD)

Morale

Marital well-being

### **Independent Variables (predictors)/ Measure / Source**

Combat exposure

Deployment length

Deployment frequency

Deployment concerns

Branch of service (Soldiers or Marines)

Gender

### **Key Findings**

The findings are from the fourth Mental Health Advisory Team (MHAT IV) conducted since the beginning of Operation Iraqi Freedom. One aim of the MHAT IV was to assess the health and well-being of the deployed force. The survey measured environmental risk factors (e.g., combat and deployment experiences), protective factors (e.g., training and leadership), behavioural health status and well-being (e.g., morale, mental health, marital well-being).

For soldiers, top deployment concerns included long deployment length, uncertain re-deployment date, being separated from family, lack of privacy and personal space, and boring or repetitive work. Marines tended to have fewer deployment concerns than soldiers due to shorter deployment duration.

Deployment tempo was related to soldier morale, in that junior enlisted soldiers who deployed multiple times reported lower morale than those who were on their first deployment.

More soldiers screened positive for anxiety and depression compared to Marines, although rates of acute

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<sup>8</sup> The scales were not described in detail.

stress (PTSD) were similar. Level of combat was positively related to screening positive for anxiety, depression, and PTSD for both soldiers and Marines, although this relationship was less pronounced for Marines. Soldiers and Marines with higher levels of combat experiences spent more time “outside the wire.”

Soldiers who had been deployed to Iraq more than once were more likely to screen positive for anxiety, depression, and/or PTSD compared to those on their first deployment. Further, soldiers deployed more than six months were more likely to screen positive on these mental disorders compared to soldiers deployed less than six months.

Soldiers and Marines who rated Non-Commissioned Officer (NCO) leadership as high were less likely to screen positive for mental health problems, even when level of combat exposure was controlled. As well, they reported higher morale.

There were no overall differences between males and females in terms of screening positive for mental health problems, although gender differences emerged when level of combat was considered. Females in the low combat condition were more likely to have a disorder compared to males, although there were no differences in the medium combat condition. There were not enough females to conduct analyses for the high combat condition.

Soldiers who deployed for more than six months were more likely to report marital problems and infidelity than those deployed less than six months. There were no differences in reported marital issues based on frequency of deployments, although many soldiers reported that they had missed significant family events due to being deployed or on training for deployment.

## Self-rated health and health care utilization after military deployments

*Military Medicine*

**Year** 2006

**Author(s)**

**Vol** 171

Trump, D. H.

**No** 7

**Pages** 662 to 668

**Method** Survey

**Participants** 22,229 U.S. Army and Air Force personnel returning from deployment to Europe or Southwest Asia; data from the Defense Medical Surveillance System

### Dependent Variables (outcomes)/ Measure / Source

Hospitalization, separation, and ambulatory care visits at one year following the deployment

### Independent Variables (predictors)/ Measure / Source

Self-rated general health following deployment

### Key Findings

An association of self-rated health with use of ambulatory care services and hospitalization was found. Specifically, military personnel with fair/poor self-rated health had an increased risk for hospitalization and for ambulatory care visits for illness at one year post-deployment. In addition, rates of separation from military service were higher among those with poorer self-rated health after deployment. Although a previous study (Trump et al., 2004) did not find an association between self-rated health and separation from military service, the current study utilized a longer follow-up period of one year (versus six months in the previous study). Thus, it may take time for the association between health and attrition to become evident. Self-ratings of health may serve as a simple assessment of health that can predict health care utilization.

## Explanations for the increase in mental health problems in UK reserve forces who have served in Iraq

*British Journal of Psychiatry*

<b>Year</b>	2007	<b>Author(s)</b>	
<b>Vol</b>	190	Browne, T.	Greenberg, N.
<b>Pages</b>	484 to 489	Hull, L.	French, C.
		Horn, O.	Rona, R. J.
		Jones, M.	Wessely, S.
		Murphy, D.	Hoptopf, M.
		Fear, N. T.	

**Method** Health survey regarding experiences in Iraq (OP TELIC)

**Participants** 786 TELIC reservists; 3936 TELIC regular force members; 800 non-deployed reservists from TELIC period; 4750 non-deployed regular force members from TELIC period

### Dependent Variables (outcomes)/ Measure / Source

General health	General Health Questionnaire (GHQ-12)	Goldberg & Williams, 1988
General health	Short-Form Health Survey (SF-36)	Ware & Sherbourne, 1992
Fatigue symptoms	Chalder Fatigue Scale	Chalder et al., 1993
PTSD	PTSD Checklist (PCL) – Civilian version	Blanchard et al., 1996
Physical health	Checklist of 53 physical symptoms	Unwin et al., 1999
Adjustment/family problems across the deployment cycle	Items developed by authors	
Marital satisfaction	3 items	Developed by authors

### Independent Variables (predictors)/ Measure / Source

Reserve versus regular force status

### Key Findings

Compared to TELIC regular force members, TELIC reservists tended to be older, better educated, higher in rank, female, in the Army, and previously married (i.e., separated, divorced, or widowed). They were less likely to be deployed as part of a parent unit.

Reservists reported lower levels of comradeship and unit cohesion and felt less well-informed. Reservists reported more problems at home during mobilization to Iraq, even though they were more likely to report that their families were proud of the deployment. Following deployment, reservists reported more readjustment difficulties and less marital satisfaction than regular force members.

All adverse health problems were more common in TELIC reservists than TELIC regular force members. Most health outcomes were explained by role in theatre, experiences of traumatic events, or lack of unit cohesion. Unexpectedly, PTSD symptoms exhibited a stronger correlation with problems at home than with experiences in Iraq. Thus, the authors concluded that the increased health problems of reservists appeared to be due to their experiences on deployment and difficulties with homecoming.

**Combat and peacekeeping operations in relation to the prevalence of mental disorders and perceived need for mental health care: Findings from a large representative sample of military personnel**

*Archives of General Psychiatry*

<b>Year</b>	2007	<b>Author(s)</b>
<b>Vol</b>	64	Sareen, J.
<b>No</b>	7	Cox, B. J.
<b>Pages</b>	843 to 852	Afifi, T. O.
		Stein, M. B.
		Belik, S. L.
		Meadows, G.
		Asmundson, G. J. G.

**Method** Data taken from the Canadian Community Health Survey – Canadian Forces supplement

**Participants** 8441 active CF personnel

**Dependent Variables (outcomes)/ Measure / Source**

Past year prevalence of major depressive disorder, panic disorder, social phobia, generalized anxiety disorder, PTSD, alcohol use disorders	Composite International Diagnostic Interview (CIDI)	Kessler & Usturn, 2004
Alcohol abuse	Heavy Alcohol Use (HAU) variable	Developed by authors
Perceived need for or received help for problems with emotions, mental health, or use of alcohol or drugs in the past year	Perceived Need for Care Questionnaire (PNCQ)	Meadows et al., 2000
Long-term restriction of activities	Question about whether a long-term health problem had reduced their activity at home, school, work, or other activities	Developed by authors
Suicidality	Questions about suicide ideation and attempts in the past year	Developed by authors

**Independent Variables (outcomes)/ Measure / Source**

Deployment-related traumatic experiences	Three questions regarding whether the member had ever participated in combat, whether they had served as a peacekeeper or relief worker in a war zone, and whether they had ever seen atrocities or massacres (e.g., mutilated bodies, mass killings)	Developed by authors
------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------

### **Key Findings**

Deployment to a combat area and witnessing atrocities were associated with an increased prevalence of psychological disorders and perceived need for care. The most common disorders were major depression, alcohol dependence, and social phobia. After adjusting for the effects of combat exposure and witnessing atrocities, deployment to peacekeeping operations was not associated with increased prevalence of mental disorders. Most of those who met the criteria for diagnosis of a mental health disorder did not use any mental health services.

### **Notes**

Although no information was available on the specific location of the deployment, the authors note that based on the age of the sample, it is likely that the respondents were involved in several different missions, including those to Iraq, Rwanda, Somalia, and the former Yugoslavia.

## **PERSTEMPO in the Canadian Forces**

*DRDC CORA TR 2007-18– Department of National Defence, Ottawa, Canada*

**Year** 2007

**Author(s)**

Sudom, K.

Dursun, S.

**Method** Survey

**Participants** 6,186 CF members

### **Key Findings**

This report provided descriptive information on aspects of perSTEMPO, potential intervening variables, and potential outcomes of high perSTEMPO, and to describe the differences in these variables as a function of rank and gender, using samples of CF personnel at all stages of the deployment cycle (pre-deployment, in theatre, and post-deployment).

It was found that the more time members spent away in the previous year, the less predictable they felt their work was. Time away was related to greater perceptions of micromanagement and lack of participation in decision-making. Greater work hours per week were related to higher role conflict and role ambiguity, and less job predictability. In general, members who were more satisfied with their job in the CF experienced less role conflict and ambiguity, and greater predictability, opportunities for training, communication within their unit, and participation in decision-making. In terms of well-being, there was a trend toward high levels of time away being associated with heightened depressive and PTSD symptoms, lower unit morale, and lower attitudes toward one's tempo of operational deployments. Suicidal ideation was more common among members who had recently returned from a deployment, compared to those who had deployed in the previous year.

There were a number of differences in the variables based on rank. Overall, senior officers worked longer hours compared to lower ranks. Juniors NCMs were the least satisfied with most aspects of their CF employment and they reported the lowest levels of mastery, self-esteem, hardiness, tended to use active coping styles less frequently. As well, Junior NCMs perceived the least amount of vertical and horizontal cohesion, reported the least commitment to the CF, the least pride in being a CF member, and the lowest morale. In general, officers had more positive attitudes toward the tempo of their deployments and their opportunities to deploy. Despite the fact that Junior NCMs reported the least satisfaction with and commitment to the military, they reported having the least amount of stress, both military and general life stress, and also reported lower levels of work-family conflict. There were few differences among the ranks based on symptoms of mental illness.

### **Notes**

A large number of measured were used in the survey. These are described in detail within the report.

### 3.1.3.2 Attitudes Toward Deployment

#### **Attitudinal variables related to an evolution of flexible tour lengths for operational deployment**

*Sponsor Research Report - Director of Human Resources Research and Evaluation (NDHQ)  
Department of National Defence, Ottawa, CA*

**Year** 2003

**Author(s)**

Léveillé, L.

**Method** Questionnaires and interviews

**Participants** Core ( $n = 42$ ) and rotational ( $n = 108$ ) members of 430 Squadron, and their families

#### **Dependent Variables (outcomes)/ Measure / Source**

Coping	COPE Inventory	Carver et al., 1989
Psychological distress	SIGNS scale	Dobrevva-Martinova, 1998a
Stress	Stress in Military Service Questionnaire	
Unit climate profile	11 item scale	

#### **Independent Variables (predictors)/ Measure / Source**

Type of unit	core or rotational
Tour length	6-month deployment versus numerous 2-month deployments (a.k.a. 12 month squadron tasking/variable personnel tour length or 12V protocol)

#### **Key Findings**

In general, although unit climate profile measures were high, the rotational group reported significantly lower unit climate profile than the core group. There was no statistical difference between the core and rotational group in terms of stressors in military service or psychological distress. Overall, the levels of stress reported on deployment were low.

Of the rotational group, 84% reported that the 12V protocol was beneficial. Most (88%) of the wives of military members preferred the 2-month deployment to the 6-month deployment. Repeated adaptation to short deployments was preferable over their spouse being absent for long continuous periods of time.

#### **Notes**

There were a number of systematic differences between the core and rotational groups (e.g. rank, nature of work), which may have accounted for some of the differences.

## Positive and negative consequences of a military deployment

*Military Medicine*

**Year** 2005

**Vol** 170

**No** 10

**Pages** 815 to 819

**Author(s)**

Newby, J. H.

McCarroll, J. E.

Ursano, R. J.

Fan, Z.

Shigemura, J.

Tucker-Harris, Y.

**Method** Survey administered 3-5 months after arrival home from deployment

**Participants** 951 active duty male and female soldiers who had been deployed to Bosnia

### **Dependent Variables (outcomes)/ Measure / Source**

Negative consequences Open answers grouped into categories

Positive consequences Open answers grouped into categories

### **Independent Variables (predictors)/ Measure / Source**

Marital status (single versus married)

### **Key Findings**

Positive consequences of deployment were reported by 77% of soldiers, while 63% reported at least one negative consequence and 47% reported both. Single soldiers were more likely than married soldiers to report positive consequences, whereas married soldiers were more likely to report negative consequences.

The most frequent positive comment about deployment was about making additional money. Other positive consequences included experiencing self-improvement and having time to think. Negative consequences included issues with the chain of command, being away from family or missing important events, and deterioration of relationship with marital partner/significant other.

When the comments were ordered according to how frequently they were endorsed, it was evident that single members were more likely to report chain of command issues as a negative consequence, whereas married members reported that being away from family/missing important events was the most negative consequence. Overall, the rank order of positive comments was similar for married and single soldiers.

The study suggests that deployments have differential impacts depending on marital status.

### 3.1.4 Family Effects

#### 3.1.4.1 Family Well-Being

##### Why does military combat experience adversely affect marital relations?

*Journal of Marriage and the Family*

<b>Year</b>	1994	<b>Author(s)</b>
<b>Vol</b>	56	Gimbel, C.
<b>Pages</b>	691 to 703	Booth, A.

**Method** Survey

**Participants** 2,101 Vietnam veterans (currently married or were married in the past)

##### Dependent Variables (outcomes)/ Measure / Source

Combat stress symptoms	Count of symptoms (nightmares, trouble sleeping, etc.)	Developed by authors
Adult anti-social behaviour	Sum of items such as “ever arrested?”, “ever made money outside the law?”, etc	Developed by authors
Education	Total educational attainment	

##### Independent Variables (outcomes)/ Measure / Source

Marital adversity	Ever divorced, cheating, abuse, and separation	Developed by authors
Combat	12 items assessing combat involvement	Developed by authors
Pre-military problems	Early emotional and school problems	Developed by authors

##### Key Findings

The study assessed the impact of combat on marriages using three models: 1) factors that lead men into combat also decrease marital quality and stability (e.g., individuals who volunteer for battle may be more likely to have psychological problems or a history of antisocial behaviour); 2) combat causes psychological problems that can increase marital distress; and 3) combat intensifies premilitary stress and antisocial behaviours, which then negatively affect marriage.

Support for all three models was found. The effect of combat on marital adversity was reduced when premilitary problems were included in the model, indicating that such factors play a role in marital quality. The effect of combat on marital adversity was mediated by post-traumatic stress symptoms and adult antisocial behaviour. When both mediators were in the model together, antisocial behaviour emerged as the strongest.

Low educational attainment, job instability, and low income had little effect on the relationship between combat and marital adversity.

**Notes**

Age, race, and intelligence were controlled for in the study.

## **PERSTEMPO: Its effects on soldiers' attitudes**

*Army Research Institute for the Behavioral and Social Sciences*

**Year** 1998

**Author(s)**

**Pages** 1 to 11

Alderks, C. E.

**Method** Analysis of data from the U.S. Sample Survey of Military Personnel (SSMP) for 1994-1997

**Participants** Stratified random sample of Active Component Army Officers and enlisted personnel

### **Dependent Variables (outcomes)/ Measure / Source<sup>9</sup>**

Satisfaction with amount of time separated from family

Most important reason for leaving/thinking about leaving the Army

Army career intentions

Readiness of unit

Readiness of individual

Unit morale

Individual morale

Family/personal life stress

Military job stress

Spouse support

Family adjustment

Satisfaction with current job

### **Independent Variables (predictors)/ Measure / Source**

Time away in past 12 months

Rank

Gender

Race

Type of Unit

Family/marital situation

Location (USAREUR/other locations)

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<sup>9</sup> Scale sources were not specified.

## **Key Findings**

Officers were more likely than enlisted personnel to report being satisfied with amount of time separated from family. Overall, personnel who were away 12 weeks or less were more likely to be satisfied with time away from family than those away 13 weeks or more, regardless of rank, gender, race, unit type, family/marital situation, or location.

About 10% of personnel who were leaving or thinking about leaving the Army indicated that the most important reason was amount of time separated from family. Males who had been away for 13 or more weeks were twice as likely as those who had been away 12 or less weeks to report that time away from family was the most important reason to leave or think about leaving the Army. This effect of time was not seen in females, although they reported a consistently high perception that time away from family was the most important reason for leaving/thinking about leaving, similar to that of males who had been away 13 or more weeks.

## The effects of a military overseas peacekeeping deployment on marital quality

*Psychological Reports*

**Year** 2000

**Vol** 87

**Pages** 815 to 821

**Author(s)**

Schumm, W. R.

Bell, D. B.

Gade, P. A.

**Method** Survey and semi-structured interview

**Participants** 113 military personnel

### Dependent Variables (outcomes)/ Measure / Source

Marital quality	4 items (trust, communication, mutual support, handling conflict)	Developed by authors
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Marital satisfaction	1 item (happiness)	Developed by authors
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### Independent Variables (predictors)/ Measure / Source

Time (before, during, and after deployment)

### Key Findings

Changes in marital satisfaction and marital quality were assessed before, during and after a peacekeeping deployment. There was a moderate decrease in marital satisfaction during the deployment, but overall over the long term there was no significant change. Marital quality did not change over time. Marital trouble before deployment was linked with lower marital stability during the deployment. In addition, marital satisfaction did not appear to be related to retention. It was concluded that six-month deployments do not result in long-term declines in marital quality or satisfaction among couples in stable marriages.

## **Managing PERSTEMPO: A critical imperative for Defence in Canada**

*Strategic Human Resource Research Note 3/2001 - Department of National Defence, Ottawa, Canada*

**Year** 2001

**Author(s)**

Dunn, J.

Flemming, S.

**Method** Focus group and survey

**Participants** **Phase 1 (Macedonia/Kosovo):** 14 focus groups with four to 10 personnel of all ranks each; 18 interviews with commanders and service providers; survey administered to over 200 personnel.

**Phase 2 (Edmonton):** Five focus groups conducted with 94 personnel and spouses.

### **Key Findings**

This paper documents part of the PERSTEMPO and Human Dimensions of Deployments Study (HDDS), the aim of which was to assess the consequences of increased personnel tempo on members, their families, and the military organization. This particular study documents the results of focus groups, interviews, and surveys conducted with CF members and their families to assess satisfaction with issues surrounding deployment to Kosovo and Macedonia. The first phase examined the pre-deployment period and quality of life in-theatre among CCKFOR personnel. Approximately one-third of the personnel were dissatisfied with their quality of life in theatre. However, there was some recognition that recent policy and program changes had a positive impact on quality of life. Sources of dissatisfaction included operational training, the shortage of personnel involved in international peace and security operations, availability of communications with family, quality of care of the injured. In general, however, members were satisfied with their living conditions and their allowances and benefits.

The second phase examined family support provided in Canada during and following the deployment. It was found that some spouses, particularly those that experienced deployment of their military spouse before, did not have a strong need for family support services and preferred to rely on their own personal support systems. However, many other spouses who anticipated support programs and services were disappointed and felt that support was not available or was inconsistent. Spouses also cited problems with communication during the deployment (e.g., telephone calls were too short or of poor technical quality). Overall, the report highlights some of the issues surrounding deployment, from the perspective of both members and their families.

## **Psychometric assessment and refinement of the Family Issues scale of the Human Dimensions of Operations (HDO) project**

*DCIEM Technical Report TR 2001-049. Department of National Defence, Ottawa, Ontario.*

**Year** 2001

**Author(s)**

Thompson, M.

Pasto, L.

**Method** Questionnaires

**Participants** 297 male and 21 female CF Land Force personnel

### **Key Findings**

This objective of this study was to assess the psychometrics properties of the Family Issues scale, a measure designed by the Directorate of Human Resources Research and Evaluation (DHRRE) in the Human Dimensions of Operations (HDO) project. Item inspection yielded two distinct sections which were subsequently treated as separate scales, called Family Attitudes (i.e., family concerns about upcoming deployment) and Perceived Support (i.e., knowledge of availability of family support services). Descriptive analyses revealed that in general, most of the listed social support sources and services were perceived as being available to respondents' families. Respondents had greater expectations of availability of friends, family and neighbors than formal military sources of support and were unsure about the availability of civilian support services. The results indicate that family concerns are a prevalent issue for military personnel who deploy. Assessing family concerns is therefore essential for the well-being and efficiency of military personnel.

## **Impacts of deployments on families: A review of recent published research findings**

*D STRAT HR Research Note RN 13/02. Department of National Defence, Ottawa, Canada.*

**Year** 2002

**Author(s)**

McEvenue, S.,

Flemming, S

**Method** Literature review

### **Key Findings**

The objective of this study was to review research findings related to Deployments and the Military Family-General; Military Children; Military Wives and Post-Traumatic Stress Disorder and the Family. This review was conducted as background information for the development of a survey to assess the demands of military service on members and their families, part of the Perstempo and Human Dimensions of Deployment Study (HDDS). Specific topics that were covered in the literature included the psychological impact of deployments on children, child behaviour problems, social support, the deployment cycle, and effects of PTSD on the family.

## Direct and indirect effects of operations tempo on outcomes from soldiers and spouses

*Military Psychology*

<b>Year</b>	2005	<b>Author(s)</b>
<b>Vol</b>	17	Adams, G.A.
<b>No</b>	3	Durand, D. B.
<b>Pages</b>	229 to 246	Burrell, L.
		Teitelbaum, J. M.
		Pehrson, K. L.
		Hawkins, J. P.

**Method** Questionnaire

**Participants** 1,384 married non-deployed soldiers from U.S. Army's III Corps (active duty, Guard, and Reserve) and 709 spouses of active duty, Guard, and Reserve soldiers

### Dependent Variables (outcomes)/ Measure / Source

Family-related outcomes	Family functioning	Walter Reed Army Institute for Research
	Single items regarding marital conflicts and satisfaction with marriage	Walter Reed Army Institute for Research
Work related outcomes	Items about attitudes toward Army	Developed by authors

### Independent Variables (predictors)/ Measure / Source

Optempo	Time away, predictability of own duty hours, predictability of spouse's duty hours, amount of stress associated with separation, whether respondent felt they spent too much time away from family	Developed by authors
Work family conflict	Work-Family Conflict (WFC) scale	Netemeyer et al., 1996

### Key Findings

The study tested for the direct effects of optempo on family- and work-related outcomes, as well as the indirect effects of optempo on these outcomes through work-family conflict (WFC). For both samples, optempo had a direct effect on Army outcomes (i.e., positive attitudes about the Army), but not on family outcomes. Optempo exerted its effects on family outcomes indirectly, through its effects on work-family conflict. That is, high levels of optempo have the most impact on families in which perceived levels of WFC are also high. The relationship between work-family conflict and Army outcomes was non-significant in both samples, suggesting that OPTEMPO may influence attitudes by mechanisms other than its effects on WFC. The results of this study draw attention to the complex relationships between work and family and the mechanisms by which military stressors impact upon them. As well, although the number of military operations is unlikely to decrease, WFC and the conditions surrounding deployments (e.g., predictability of duty hours) may be feasible targets for intervention and policy changes.

**Predicting work-family conflict from workload, job attitude, group attributes and health:  
A longitudinal study**

*Military Psychology*

<b>Year</b>	2005	<b>Author(s)</b>
<b>Vol</b>	17	Britt, T. W.
<b>No</b>	3	Dawson, C. R.
<b>Pages</b>	203 to 227	

**Method** Surveys administered at 2 time points (June-Aug and Sept-Dec 1999)

**Participants** 493 soldiers in garrison stationed in Europe

**Dependent Variables (outcomes)/ Measure / Source**

Work-family conflict	Work-Family Conflict (WFC) Scale	Netemeyer et al., 1996
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**Independent Variables (predictors)/ Measure / Source**

Workload	Hours worked per day (on and off duty) in last week	Castro & Adler, 2000
	Days on training exercises in last 6 months	
	Days of leave lost in last 12 months	
	Hours of sleep per night in last week	
	Role Overload Scale	Cammann et al., 1983
Job attitudes	Job engagement	Britt, 2003; Britt et al., 2001
	Challenge at work	
	Effort at work	
	Job control	
	Job satisfaction	
	Job significance	
	Job recognition	
	Military pride	
Unit attributes	Unit cohesion	Podsakoff & MacKenzie, 1994
	Combat readiness	
	Officer and NCO leadership	
	Overall leadership	

Health	Depression (CES-D)	Radloff, 1977
	Physical health symptoms	Bliese et al., 1998
	Morale	Britt, 1997

### **Key Findings**

The paper examined both concurrent and longitudinal predictors of work-family conflict (WFC). Workload (higher work hours per day, less sleep, and more days training), physical symptoms, and morale were the strongest concurrent predictors of WFC.

For the entire sample, when WFC at time 1 was controlled, physical symptoms and horizontal cohesion at time 1 predicted WFC at time 2, in that higher cohesion and greater levels of symptoms were associated with higher WFC. The authors suggest that high cohesion may function to bring soldiers closer to work aspects of their life, which can lead to greater WFC. Among married personnel or those who had a child at home only, job satisfaction and job recognition were longitudinal predictors of lower WFC.

Ratings of leadership moderated several of the longitudinal relationships between the predictors and WFC. Specifically, the relationship between horizontal cohesion and WFC, physical symptoms and WFC, and job significance and WFC, were moderated by positive ratings of officer leadership. That is, there was a buffering role for officer leadership, such that positive leadership reduced the impacts of these variables on WFC.

Job significance was a moderator in the longitudinal relationship between cohesion and WFC, in that high cohesion was associated with higher WFC only when soldiers perceived a low level of job significance.

### 3.1.4.2 Family Violence

#### Deployment and the probability of spousal aggression by U.S. Army soldiers

*Military Medicine*

**Year** 2000

**Vol** 165

**Pages** 41 to 44

**Author(s)**

McCarroll, J. E.

Ursano, R. J.

Liu, X.

Thayer, L. E.

Newby, J. H.

Norwood, A. E.

Fullerton, C. S.

**Method** Probabilities of moderate and severe violence by length of deployment were estimated using multinomial logistic regression and ordered probit analysis.

**Participants** 26,835 deployed ( $n = 11,540$ ) and non-deployed ( $n = 15,294$ ) married U.S. Army active duty personnel (men and women) between 1990-1994

#### Dependent Variables (outcomes)/ Measure / Source

Violence

Conflict Tactics Scale

Straus, 1979

#### Independent Variables (predictors)/ Measure / Source

Deployment status (deployed, not-deployed)

Length of tour (days)

#### Key Findings

Deployment contributes a small but significant increase in the probability of spousal aggression over a one-year period. When demographic variables were controlled, the probability of severe aggression was significantly greater for soldiers who had deployed in the past year, compared to those who had not. Probability of severe aggression increased with greater length of deployment. Specifically, the rate of violence in the absence of deployment was approximately 4%, and this increased to 5% following deployments of 6-12 months duration. The authors point out that the data are cross-sectional, and other factors such as frequency of deployments and location of deployment may need to be considered.

## Postdeployment domestic violence by U.S. Army soldiers

*Military Medicine*

**Year** 2005

**Vol** 170

**No** 8

**Pages** 643 to 647

**Author(s)**

Newby, J. H.

Ursano, R. J.

McCarroll, J. E.

Liu, X.

Fullerton, C. S.

Norwood, A. E.

**Method** Survey

**Participants** 1,188 spouses of deployed and non-deployed soldiers

**Dependent Variables (outcomes)/ Measure / Source**

Domestic violence                      Conflict Tactics Scale

Straus, 1979

**Independent Variables (predictors)/ Measure / Source**

Deployment status of military spouse

**Key Findings**

The aim of the study was to determine whether a 6-month deployment predicted domestic violence against the wives of soldiers during the post-deployment period. It was found that deployment did not significantly predict domestic violence during the first 10 months following the deployment. Younger wives, as well as those who had experienced domestic violence prior to the deployment, were more likely to report abuse. It was concluded that interventions should focus on younger couples and those with a history of domestic violence.

## **Child maltreatment in enlisted soldiers' families during combat-related deployments**

*Journal of the American Medical Association*

**Year** 2007

**Author(s)**

**Vol** 298

Gibbs, D. A.

**No** 5

Martin, S. L.

**Pages** 528 to 535

Kupper, L. L.

Johnson, R. E.

**Method** Comparison of rates of child maltreatment during periods of deployment and non-deployment, using linked data from personnel electronic databases (Army Central Registry, which keeps track of child maltreatment cases, and Army human resources data, which tracks deployments)

**Participants** 1,771 families of U.S. Army active duty soldiers with at least one substantiated case of child maltreatment

### **Dependent Variables (outcomes)/ Measure / Source**

Ratios of child maltreatment based on deployment status

### **Independent Variables (predictors)/ Measure / Source**

Deployment status (deployed versus non-deployed)

### **Key Findings**

The rate of child maltreatment during soldier deployments was 42% higher than the rate of maltreatment when soldiers were not deployed. The elevated rate of maltreatment during deployment was due to higher rates of maltreatment by female civilian spouses during those times. This was particularly pronounced for neglect and physical abuse. The authors explain this finding in terms of the increased stress that deployment places on the parent remaining behind. There were no differences in rates based on whether individuals had one or multiple deployments. Although it might be expected that multiple deployments would lead to more cases of maltreatment, the authors suggest that the parent remaining behind may develop coping strategies during the soldier's initial deployment that may help to deal with subsequent deployments.

### **Notes**

The study only examined combat-related deployments. Since all families in the study had a substantiated case of maltreatment, Army-wide prevalence rates cannot be determined.

### 3.1.5 Organizational Effects: Retention, Readiness, and Performance

#### **Does perstempo hurt reenlistment? Effects of long or hostile perstempo on reenlistment**

*Rand Corporation, Arlington VA*

**Year** 1998

**Author(s)**

Hosek, J.

Totten, M. E.

**Method** Literature review

#### **Key Findings**

Overall, findings indicated that adding a long or hostile duty to personnel who already had a long or hostile duty would decrease reenlistment. However, for individuals without prior experience with a long or hostile duty, gaining one is expected to increase reenlistment. An increase in hostile duty is defined differently for the different services: 30 day (or more) deployment to hostile areas for the Army; multiple short deployments to hostile areas for the Air Force; more vessels and time spent in hostile water for Marines and Navy.

The level of long or hostile duty in 1993-1995 (after the Gulf War) increased first-term reenlistment among Army and Marines. In contrast, there was no effect of long or hostile duty on first-term reenlistment in the Navy or Air Force. In all four services, long or hostile duty increased reenlistment for early-career personnel who were beyond the first term but had 10 or fewer years of service. However, excessive levels of hostile or duration of duty can decrease reenlistment, highlighting the importance of having a balance of long or hostile duty among members.

The authors suggest that facilitating accurate expectations of the extent and nature of long or hostile duty can reduce the potential negative effects of such deployments on reenlistment.

## **Operational tempo and Army reserve unit personnel readiness**

*Masters's Thesis – Faculty of the U.S. Army Command and General Staff College*

**Year** 1998

**Author(s)**

Pritchett, J. S.

**Method** Investigation of historical literature and review of previous surveys

### **Key Findings**

The Army Reserve is becoming increasingly important for the U.S. military. The author focused on the personnel readiness factors of recruiting, training, and retention. As operational tempo increases, recruiting and retention decrease. The relationship between operational tempo and training is less clear. The relationship between operational tempo and readiness can be mitigated by certain factors (e.g., financial incentives: high debt levels can mitigate effects of high tempo since reservists will be motivated to serve in order to reduce their debt).

## **OPTEMPO: Effects on soldier and unit readiness**

*Parameters, US Army War College Quarterly*

**Year** 1999

**Pages** 86 to 95

**Author(s)**

Castro, C. A.

Adler, A. B.

**Method** Surveys

**Participants** 2,256 U.S. soldiers stationed in Europe

### **Key Findings**<sup>10</sup>

Soldiers with fewer years of service had greater deployment tempo than soldiers with more years of service. That is, their rate of deployment per year was higher. In recent years, soldiers with a given length of service deploy far more frequently compared to soldiers in the past with an identical length of service. When increased garrison duties and training exercises are considered, these differences may be even more dramatic.

Across all ranks, 17% of soldiers said they would not make the military a career because there are too many deployments. But, deployments in themselves were not viewed negatively, as over half of soldiers surveyed indicated that deployments made their work more interesting and showed how important their job was. Those intending to leave were more likely to indicate that deployments hurt their marriage and put a strain on their family, compared to those planning to stay.

Length of deployment was associated with greater symptoms of psychological distress. Soldiers who were deployed for longer periods (i.e., more than five months) had greater symptoms of psychological distress compared to those who deployed for shorter periods. Furthermore, the soldiers who exhibited high levels of psychological symptoms test were more likely to also report physical symptoms than soldiers with fewer psychological symptoms.

### **Notes**

The study defines optempo in terms of three categories: deployments, training exercises and garrison duties. However, the authors also recognize that optempo and deployment are often used interchangeably.

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<sup>10</sup> The measures used in this study were not described.

## **An analysis of the effects of deployment on turnover in the United States Army reserve**

*Masters Thesis, Naval Postgraduate School*

**Year** 1999

**Author(s)**

McCloskey, M. A.

**Method** Semi-structured telephone interviews

**Participants** 52 prior Army Reservists who left the Reserves after a recent deployment to Germany, Bosnia, or U.S.

### **Variables (outcomes)/ Measure / Source**

Interview topics revolved around involvement (commitment to success), demotivators (factors that frustrate and may reduce performance), equity (performance standards), reinforcement (providing encouragement, guidance and feedback to subordinates), relevance of reward (perceptions of meaningfulness of rewards), and goals (clarity of information received about mission goals)

### **Key Findings**

Most soldiers reported that they supported the reasons for their deployment, and felt committed to the mission. Responses were mixed on whether leadership did their best to remove factors that may have made soldiers' jobs more difficult. Those who reported negatively on their leaders were most distressed about family separation, poor leadership, and financial problems.

Many of the reservists felt that they were not evaluated equally with the other reservists or with active duty personnel, although the majority perceived performance expectations to be the same for all soldiers.

Negative responses on reinforcement revolved around confusion with the chain of command, since many reservists were moved from job to job, thus not having sufficient experience with one leader or chain of command.

Most soldiers reported that they would be satisfied with and motivated by the Army's award system.

Respondents reported that the best things about their deployment were opportunity to travel, money, and working in their Military Occupation Specialty (MOS). The worst factors were family separation, poor leadership, and financial problems. Most participants reported that they had wanted to go on the deployment. Therefore, the authors concluded that it was not only the deployment itself that prompted members to leave, but also certain elements associated with deployment (e.g., family separation).

## **The impact of deployment on the retention of military reservists**

*Armed Forces & Society*

**Year** 2000

**Author(s)**

**Vol** 26

Kirby, S. N.

**No** 2

Naftel, S.

**Pages** 259 to 284

**Method** Tracking of retention over a three-year period using data from the 1991 Guard/Reserve Survey of Officers and Enlisted Personnel, and Quarterly Master Personnel Files from the Defense Manpower Data Center

**Participants** 3,269 reserve personnel

### **Dependent Variables (outcomes)/ Measure / Source**

Retention in the reserve force

### **Independent Variables (predictors)/ Measure / Source**

Time (retention data examined over a 3-year period)

Aspects related to mobilization (whether the individual was mobilized during Operation Desert Shield/Storm; change in income when mobilized; estimate of likelihood of being called to mobilize in the next five years)

Years of service (divided into two categories: 4-6 and 7-12 years)

### **Key Findings**

Being mobilized during Operation Desert Shield/Storm did not adversely affect retention. The estimated probability of being mobilized in the future had a positive effect on retention, suggesting that reservists were open to the opportunity to put their skills and training to use on deployments. Reported income loss associated with deployment did not affect retention. It was concluded that it is likely that mobilization of reserves in the future, under similar conditions, is not likely to affect retention.

## **The impact of multiple deployments on soldiers' peacekeeping attitudes, morale and retention**

*Armed Forces & Society*

**Year** 2000

**Author(s)**

**Vol** 27

Reed, B. J.

**No** 1

Segal, D. R.

**Pages** 57 to 78

**Method** Surveys administered two months after returning from a deployment to Haiti, Florida, or Somalia

**Participants** 512 members from 10<sup>th</sup> Mountain Division

### **Dependent Variables (outcomes)/ Measure / Source**

Personal morale	Single item	Developed by authors
Reenlistment intentions	Self reported intentions (single question)	Developed by authors

### **Independent Variables (predictors)/ Measure / Source**

Deployments to Hurricane Andrew (Florida – disaster relief), Operation Restore Hope (Somalia), and/or Operation Uphold Democracy (Haiti)

### **Key Findings**

Personal morale was negatively correlated to the number of deployments, such that as the number of deployments increased, the number of soldiers reporting high or very high morale decreased. However, there was no significant relationship between the number of deployments and intentions to reenlist.

### **Notes:**

Rank and branch (combat arms, combat support, and combat service support) were controlled for in the analyses.

## Navy mothers experiencing and not experiencing deployment: Reasons for staying in or leaving the military

*Military Psychology*

<b>Year</b>	2001	<b>Author(s)</b>
<b>Vol</b>	13	Kelley, M. L.
<b>No</b>	1	Hock, E.
<b>Pages</b>	55 to 71	Bonney, J. F.
		Jarvis, M. S.
		Smith, K. M.
		Gaffney, M. A.

**Method** Survey and semi-structured interview 3-6 weeks pre-deployment and 3-6 weeks after deployment. Women in the non-deployed group interviewed 8 months apart.

**Participants** 154 active-duty enlisted Navy mothers (71 deployed and 83 non-deployed)

### Dependent Variables (outcomes)/ Measure / Source

Anxiety	Anxiety questionnaire	Kremen, 1990
Maternal separation anxiety	Maternal Separation Anxiety Scale	Hock et al., 1989
Motherhood investment	Maternal Role Investment Scale	DeMeis et al., 1986
Reenlistment intentions	Questions regarding likelihood to reenlist and reasons for staying	Developed by authors

### Independent Variables (predictors)/ Measure / Source

Deployment status (deployed versus not deployed)

Time (pre- and post-deployment)

### Key Findings

Reenlistment intentions did not differ by deployment status, but the reasons for remaining or leaving varied between the groups. Women who experienced deployment were more likely than non-deployed women to report commitment to the Navy as a reason to reenlist. The authors suggest that self-selection may explain this to some extent, in that women who are more committed may be more likely to choose occupations within the Navy that involve ship assignments. Non-deployed women were more likely to report dissatisfaction with the Navy compared to those who deployed. Over half of non-deployed women cited military benefits as a reason for staying in the Navy.

At the initial assessment, intention to reenlist was associated with commitment to a Navy career, satisfaction with benefits, and a perception that workday separations would benefit children. Intention to leave the military was associated with dissatisfaction with the Navy, concerns about balancing work and family, and higher commitment to motherhood.

At the final assessment, predictors of reenlistment intentions included the initial reenlistment intentions assessed at pre-deployment, commitment to a Navy career, satisfaction with benefits, low levels of work-family issues, and satisfaction with the military.

## The effects of PERSTEMPO on officer retention in the U.S. military

Rand Corporation, Arlington VA

**Year** 2002

**Author(s)**

Fricker, R. D.

**Method** Examination of existing databases from 1990-1999 (measures of deployment from pay records and individuals' unit association; demographic information). Statistical modeling techniques were used to look at differences in retention patterns by occupation and demographics and between deployment and retention.

**Participants** Officers at two major phases of their career: junior officers immediately after expiration of initial service obligation, and mid-grade officers with 5-10 years of service

### Dependent Variables (outcomes)/ Measure / Source

Retention

### Independent Variable s (predictors)/ Measure / Source

Hostile vs. non-hostile deployments

Phase in career (junior vs. mid-grade officer)

### Key Findings

There was a positive association between increasing amounts of non-hostile deployments and junior and mid-grade officer retention, such that officers who participated in more non-hostile deployments were retained at a higher rate. However, having a hostile deployment can reduce this effect, especially among junior officers. For mid-grade officers, the effects of hostile deployments on retention were not as negative. In fact, hostile deployments may even have had a positive effect on retention of Navy and Marine Corps officers. The authors explain that this effect may be due to self-selection.

Even though having a hostile deployment reduced retention among some members, those officers with some or all hostile deployments were retained at higher levels than those who did not deploy at all.

The authors note the findings are in contrast with common assumptions that deployment is associated with higher attrition.

### Notes

Since the deployment data was constructed from pay records (i.e., those receiving Imminent Danger Pay and/or Family Separation Allowance), the measures only capture particular types of deployments. In particular, they do not take into account shorter or unplanned deployments. As well, actual deployments cannot be differentiated from long unaccompanied tours of duty. However, it is recognized that this time away is also difficult for members and their families.

## **Serving away from home: How deployments influence reenlistment**

*Rand Corporation, Arlington VA*

**Year** 2002

**Author(s)**

Hosek, J. R.

Totten, M.

**Method** Tested a model of the effects of deployment on reenlistment (data from personnel records)

### **Dependent Variables (outcomes)/ Measure / Source**

Reenlistment decision

### **Independent Variables (predictors)/ Measure / Source**

Number of deployments over a three-year period

Type of deployment (hostile, non-hostile)

Term of service (first versus second)

Dependency status (having dependants versus not having dependents)

### **Key Findings**

Two models were tested: one that considered reenlistment as a function of deployment indicators, and another that hypothesized that the effects of deployment on reenlistment act indirectly through the effects of deployment on promotion.

Model 1: For the first term, reenlistment generally rose with non-hostile deployments and did not change with hostile deployments. Reenlistment declined somewhat for members with three or more hostile tours. For the second term, reenlistment increased with non-hostile deployments and with the first and second hostile deployment.

Model 2: Time to promotion was shorter with a greater number of non-hostile deployments, but it was not affected greatly by number of hostile deployments. However, the effect of deployment on speed of promotion was small. Shorter time to promotion was associated with only a small increase in reenlistment. The effect of deployment on reenlistment was mostly direct.

For any given number of hostile and non-hostile deployments, members with dependants typically had a higher reenlistment rate than those without dependants. Further, reenlistment among these members tended to increase with increasing numbers of hostile and non-hostile deployments.

The findings support the notion that members use their experience from deployments to revise their expectations about whether they like deployments. This can bridge decisions between past deployments and current reenlistment.

## **Deployment, retention, and compensation**

*Rand Corporation, Arlington VA*

**Year** 2004

**Author(s)**

Hosek, J.

**Method** Testimony before the Committee on Armed Services, Subcommittee on Total Force. Analysis of deployment and retention based on data from 1993-1999<sup>11</sup>.

### **Dependent Variables (outcomes)/ Measure / Source**

Retention (reenlistment status)

### **Independent Variables (predictors)/ Measure / Source**

Type of deployment (hostile versus non-hostile)

Reenlistment term (first versus second)

### **Key Findings**

Deployments to hostile environments had little effect on reenlistment of first-term personnel, compared to personnel having no prior hostile deployments. Deployments to hostile environments were associated with a higher rate of reenlistment for second-term personnel.

Non-hostile deployments increased first-term reenlistments above levels of non-deployed personnel. This trend was even more pronounced among second-term personnel.

In terms of deployment length, longer separation from friends and family decreased reenlistment of first term personnel on hostile deployments, especially in the Navy.

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<sup>11</sup> Specific information regarding the number of individuals in the database from year to year was not given.

## The impact of operations tempo on turnover intentions of Army personnel

*Military Psychology*

**Year** 2005

**Author(s)**

**Vol** 17

Huffman, A. H.

**No** 3

Adler, A. B.

**Pages** 175 to 202

Dolan, C. A.

Castro, C. A.

**Method** Survey and follow-up interview

**Participants** 288 U.S. soldiers stationed in Europe who were near the reenlistment window completed the survey; of these 177 were interviewed at follow-up

### Dependent Variables (outcomes)/ Measure / Source

Actual turnover data Army records (leave or stay)

Career decision Potential factors affecting career decisions

Developed by authors

Interview questions about career decisions

Developed by authors

### Independent Variables (predictors)/ Measure / Source

Career intentions Single item

Tremble et al., 2003

Optempo Number of deployments in military career, hours worked per day in past week, days on training exercises in past six months, days worked in previous week, days on temporary duty (TDY) in past six months

### Key Findings

Career intentions closely matched actual turnover decisions. Longer work hours were also associated with turnover. However, turnover was not associated with number of deployments or with number of training exercises.

The relationship between days on temporary duty (TDY) and turnover intentions was curvilinear, such that at very high and very low levels of TDY, turnover was high, whereas at moderate levels, turnover was low. The other measures of optempo did not show a curvilinear relationship with turnover intentions, in contrast to what the researchers had expected.

Interview data indicated that it is not necessarily workload aspects of optempo (e.g., work hours, number of deployments) that influence decisions to stay or leave. Attitudes about work, training, and deployments play an important role as well. For example, soldiers who find their work meaningful and challenging are more likely to stay. As well, broader factors such as educational opportunities and family concerns affect decisions to stay or leave.

## Measuring operations tempo and relating it to military performance

*Military Psychology*

**Year** 2005

**Vol** 17

**No** 3

**Pages** 137 to 156

**Author(s)**

Thomas, J. L.

Adler, A. B.

Castro, C. A.

**Method** Surveys administered to separate samples in garrison, in training, and on deployment

**Participants** 695 U.S. soldiers in Europe

### Dependent Variables (outcomes)/ Measure / Source

#### Performance measures

Personal discipline	Violations of the code of military justice	
Demonstration of effort	Number of awards received	
Job-relevant task skills	M16 weapons scores	
Physical fitness	Army Physical Fitness Test scores	
Combat readiness	4-item scale	Jex & Bliese, 1999
Job satisfaction	3-item scale	Marlowe et al., 1985; Vaitkus, 1994

### Independent Variables (predictors)/ Measure / Source

#### Optempo/work overload measures

Workload	Hours worked per day in the past week	
	Training days in the past 6 months	
	Number of deployments lasting more than 30 days	
Role overload	3 item scale	Cammann et al., 1983

### Key Findings

The four measures of optempo were correlated to examine their interrelatedness. Work hours were related to all measures of work overload. Thus, the authors note that work hours may be an acceptable proxy measure of work overload, and that role overload should also be used when assessing workload.

Combat readiness and fitness were correlated with most of the other performance measures. Thus, they

may be the most relevant factors in terms of indicators of performance.

In terms of the relations between optempo and performance, workload was positively related to fitness, M16 scores, and job satisfaction, while being negatively related to violations and financial strain. Number of days spent on training was positively associated with combat readiness. Number of deployments was positively related to number of awards received and job satisfaction. Role overload was not strongly related to performance. The only performance measure that role overload was significantly correlated with was financial strain. That is, individuals who felt overextended in terms of their work also felt overextended in terms of their finances. The authors suggest that the lack of impact of role overload on the other performance measures may indicate that performance is relatively stable and not affected by perceptions of overload, which may be transient.

Soldiers in a training environment reported the most hours worked per week, while those in garrison reported the least. However, despite the increased hours, role overload was not perceived to be higher for soldiers in training compared to garrison or deployment.

Soldiers reported higher fitness scores and job satisfaction scores when in a training environment compared to garrison or deployed environments. Expectedly, unit combat readiness was higher among those deployed and on training, in comparison to soldiers in garrison.

The military setting (i.e., training, garrison, or deployment) moderated the effects of work overload on fitness scores. That is, when in a deployed environment, workload and fitness were positively related, whereas they were negatively related in garrison and training environments.

## How deployments affect service members

Rand Corporation, Arlington VA

**Year** 2006

**Author(s)**

Hosek, J.

Kavanagh, J.

Miller, L.

**Method** Literature review, focus groups and analysis of existing data (Status of Forces Surveys of Active Duty Personnel and conducted by the Defense Manpower Data Center)

**Participants** Focus groups: 80 enlisted personnel and 16 officers; surveys:  $n = 10,828$  in first administration and  $n = 10,284$  in second administration

### **Dependent Variables (outcomes)/ Measure / Source**

Higher-than-usual personal stress

Higher-than-usual work stress

Likelihood of staying on active duty

Likelihood of staying on active duty for 20 years or more

Whether being away in last year affected desire to stay

Perceptions of degree to which spouse thinks member should stay on active duty

### **Independent Variables (predictors)/ Measure / Source**

Number of times worked longer-than-usual duty day in past 12 months

Away from permanent station in past 12 months

Involvement in Afghanistan (Op Enduring Freedom) or Iraq (Op Iraqi Freedom)

Away more or less time than expected

Individual preparation

Unit preparation

### **Key Findings**

The researchers developed a conceptual model of the effects of deployments on individual utility, performed a literature review, discussed findings from focus groups exploring deployment and work-related issues, and presented survey findings.

The model demonstrates how the probability of deployment, expected length of deployment, randomness of deployment length, base pay, and deployment pay affect utility (i.e., well-being). It assumes that individuals have preferences regarding home time, deployment time, and pay. Variations in these factors from one's expectations can impact utility. The authors suggest that satisfaction from deployment time depends on individual preparedness, unit preparation, unit cohesion, combat/risk conditions, length of workday, communication with family, family support programs, length of deployment, and uncertainty about deployment length.

The sociological literature focuses on small group dynamics and unit cohesion, combat motivation, effect of operations on morale, and tension between military and family life, while the psychology literature

focuses on stress and individual performance.

Focus groups revealed that preparing for deployment created stress in terms of training, personal preparation and family preparation. Factors that increased personal stress and led to burnout included weeks of fast-paced work and time away prior to deployment, increased length and frequency of deployment, long work hours, and intense work pace. The use of informal support sources (friends and colleagues) was helpful in coping with stress and dealing with traumatic experiences, as opposed to formal sources. Benefits of deployment included financial gain, ability to use training in the real world, sense of accomplishment, and building stronger bonds with one's unit.

In the analysis of survey data, it was found that being away in itself did not affect stress levels or intention to stay. Rather, the effect of time away came from the fact that individuals who were away had longer work days than those at home base. When personnel were away more than expected, higher-than-usual work stress was more likely, and intention to stay was less likely. When members felt prepared and felt that their unit was prepared, work stress was lower and intention to stay was higher.

## **Deployment, stress, and intention to stay in the military**

*Rand Corporation, Arlington VA*

**Year** 2006

**Author(s)**

Hosek, J.

Kavanagh, J.

Miller, L.

**Method** Synopsis of a literature review and previous data collection (focus groups and surveys) by Rand on the impacts of deployments on retention

**Participants** Focus groups and data from DoD's "Status of Forces Surveys of Active Duty Personnel"

### **Key Findings**

By examining the literature and data collected on the impacts of deployments on retention, the authors found that military personnel value deployments as a chance to use their training in real situations. Some of the most negative aspects of deployments reported were family separation, high optempo, long work hours, and uncertainty surrounding deployments (e.g., lack of predictability in the deployment schedule). However, deployment pay helped to offset the negative impacts of deployment.

Other factors that served to reduce stress included social support and preparedness. Combat-related stress was often dealt with using informal peer support networks. Members who felt prepared for the deployment from their training reported lower stress and higher rates of reenlistment.

Analysis of the focus groups and surveys led to the following recommendations for DoD: spread deployments widely across service members and units; examine additional ways to compensate deployed personnel with repeated or long duration duty; consider pay and recognition for non-deployed personnel who frequently work long days; provide access to communication channels to home for those deployed; and consider ways to improve the stigma of seeking professional counseling for combat-related stress symptoms.

## **The Human Dimensions of Operations Survey: A qualitative analysis of three post-deployment surveys**

*Director Personnel Applied Research, Department of National Defence, Canada*

**Year** 2006

**Author(s)**

Garabedian, K.

**Method** Analysis of written comments on the Human Dimensions of Operations (HDO) survey

**Participants** 1,277 CF members approximately 6 months following deployment (three operations between 2001-2005)

### **Independent Variables (predictors)/ Measure / Source**

The survey asked members whether they would return on a similar operational tour (and reasons why or why not), and how they felt about leadership during their deployment.

### **Key Findings**

Most of the respondents (71%) stated that they would return on similar tour. Reasons for wanting to return included: deployment was a learning experience; financial; sense of duty/responsibility; challenge; and sense of purpose. Eighteen percent reported that they would not return. Of these, reasons included the perception that the operation was a waste of time; leadership issues; personal reasons (e.g. family); lack of cohesion; and personnel shortage issues. Approximately one-half of respondents reported positive comments about leadership, while negative comments were given by just over one-third of respondents. Many respondents felt that leadership did not show interest in troops, or were lacking experience. The author noted that it is important to ensure that soldiers feel challenged on operations, that families are supported throughout the deployment cycle, and that leadership concerns are addressed.

## **Deployment consequences: A review of the literature and integration of findings in a model of retention**

*U.S. Army Research Institute for the Behavioral and Social Sciences*

**Year** 2006

**Pages** 1 to 44

**Author(s)**

Wisecarver, M. M.

Cracraft, M. L.

Haffner, T. S.

**Method** Literature review

### **Key Findings**

The literature review revealed that deployments have both positive and negative effects on reenlistment. Too few or too many deployments had a negative impact on retention. Soldiers with one to two deployments had higher rates of reenlistment, while those with three or more deployments had lower rates of reenlistment. Further, more than three to four months in a hostile location had a negative impact on first term attrition.

Separation from family was one of the top reasons for attrition. Deployments can have a negative effect on families, but it has been found that spouses can cope with the separation for at least up to six months. In addition to effects on families, deployments affect the health of soldiers. However, the effects of poor health on reenlistment are not clear. Although the length and frequency of deployments are important factors to consider in terms of soldiers' reactions to such experiences, the conditions during deployment (e.g., perceived fairness of decisions, supervisor support) may be even more important in this respect.

The authors proposed a model of retention that considers the impact of deployments on decision to reenlist. This model includes factors found in the literature to be important for retention, such as job experiences, commitment to the organization, commitment to family/hobbies, ties to the community, and unexpected events (e.g., a job offer). While many of these factors are outside the control of the military, the military can have an impact on two of these areas: individual job experiences and commitment to the organization. The effects of deployments on commitment to the organization must be considered.

### 3.1.6 Moderating and Intervening Variables

#### 3.1.6.1 Individual Level

##### Stress, health & adaptation during Operation Joint Endeavor

Poster presented at NATO Partnership for Peace Workshop Psychological Readiness for Multinational Operations: Directions for the 21st Century

**Year** 1997

**Author(s)**

Bartone, P. T.

Britt, T. W.

Adler, A. B.

**Method** Questionnaires given at pre-deployment and during deployment

**Participants** 103 U.S. Army personnel deployed to the Former Yugoslavia

##### Dependent Variables (outcomes)/ Measure / Source

Depression	Short form (7 item) CES-D	Radloff, 1977
Psychiatric symptoms	20 item scale based on the World War II American Soldier studies (Stouffer et al., 1949)	Bartone et. al, 1989

##### Independent Variables (predictors)/ Measure / Source

Stress exposure	List of potential stressors relevant to pre-deployment and mid-deployment operational phases	Developed by authors
Hardiness	Hardiness Scale	Bartone, 1995

##### Key Findings

Pre-deployment stressors included time pressure to complete preparations for the deployment, preparing the family for the deployment, concern about families being taken care of by Rear Detachment, and sense of isolation. Problems with unit leaders and boredom were also identified as stressors in the pre-deployment period.

Total pre-deployment stressor exposure predicted depression scores at mid deployment as well as later psychiatric symptoms. Hardiness interacted with stressor exposure to predict psychiatric symptoms, such that under high stress conditions, soldiers high in hardiness were more resilient and healthy. However, hardiness was not a moderator for depression.

## **Hardiness protects against war-related stress in the Army reserve forces**

*Consulting Psychology Journal: Practice and Research*

**Year** 1999

**Author(s)**

**Vol** 51

Bartone, P. T.

**No** 2

**Pages** 72 to 82

**Method** Surveys administered shortly after the Gulf War

**Participants** 389 participants from six Army National Guard and reserve medical units

### **Dependent Variables (outcomes)/ Measure / Source**

Psychiatric symptoms	Brief Symptoms Inventory	Derogatis & Melisaratos, 1983
Physical health	20 item checklist	Derived from Bartone et al., 1989; Stouffer et al., 1949
PTSD	Impact of Events Scale	Horowitz et al., 1979

### **Independent Variables (predictors)/ Measure / Source**

Hardiness	15 item scale	Derived from Kobasa, 1979; Maddi & Kobasa, 1984
Wartime stress	15 items specific to Gulf War	Developed by authors
Life event stressors	Holmes-Rahe Major Stressful Life Events Scale	Holmes & Rahe, 1967

### **Key Findings**

Proximity to the battlefield was associated with higher levels of combat stress exposure, as well as with increased symptoms on all three health indicator scales (i.e., physiological health, psychiatric and PTSD symptoms).

Hardiness predicted more positive health, whereas combat-related stress and life stress predicted poor health. Hardiness interacted with combat-related stress and stressful life events to predict psychiatric symptoms. That is, under high combat conditions or high levels of stressful life events, individuals who were high in hardiness exhibited fewer psychiatric symptoms than those who were low in hardiness. The author suggested that the positive effects of hardiness may be due to that possibility that hardy individuals are better able to develop and utilize social support, or that they are able to attach more positive meaning and importance to their work.

## Deriving benefits from stressful events: The role of engagement in meaningful work and hardiness

*Journal of Occupational Health Psychology*

<b>Year</b>	2001	<b>Author(s)</b>
<b>Vol</b>	6	Britt, T. W.
<b>No</b>	1	Adler, A. B.
<b>Pages</b>	53 to 63	Bartone, P. T.

**Method** Surveys administered midway through a 1-year deployment in Bosnia, Hungary, and Croatia and 4-5 months after return

**Participants** 161 during deployment; 1,953 after deployment

### Dependent Variables (outcomes)/ Measure / Source

Perceived benefits of deployment	9 items	Developed by authors
Experience of events that placed mission in a meaningful context	6 items	Developed by authors
Engagement in job	6 items	Developed by authors
Job importance	7 items	Developed by authors
Peacekeeper identity	5 items	Developed by authors

### Independent Variables (predictors)/ Measure / Source

Hardiness	Hardiness Scale	Bartone, 1995
Location of deployment		
Gender		

### Key Findings

Personality hardiness was associated with engagement in meaningful work during the deployment. In this regard, soldiers high in hardiness identified with their peacekeeping role, believed their job on the mission was important, and felt personally engaged in the mission. Engagement in meaningful work was strongly associated with deriving benefits from the peacekeeping tour after it was over.

Soldiers deployed to Hungary (a support area removed from the conflict) reported less contextual experiences and fewer benefits than soldiers deployed to Bosnia and Croatia. When contextual experiences were controlled, the effect of location on perceived benefits was no longer significant. Thus, the authors suggest that the perceived benefits were due to differences in experiences of events that placed the mission in a meaningful context.

## Testing the stress-buffering effects of self engagement among soldiers on a military operation

*Journal of Personality*

**Year** 2003

**Author(s)**

**Vol** 71

Britt, T. W.

**No** 2

Bliese, P. D.

**Pages** 245 to 266

**Method** Questionnaires

**Participants** 1,181 Army personnel from Operation Joint Endeavor (OJE) in Bosnia

### **Dependent Variables (outcomes)/ Measure / Source**

Psychological distress                      Global Severity Index                      Derogatis & Melisaratos, 1983

### **Independent Variables (predictors)/ Measure / Source**

Job engagement                      Job Engagement Scale                      Britt et al., 2001

Amount of sleep                      Self-reported hours of sleep per night

Stressors on deployment                      15 family and work stressors                      Developed by authors

### **Key Findings**

Job engagement interacted with stressors on deployment (lower amounts of sleep, work stress, and family stress), to predict psychological distress. When stressors were low, soldiers reported relatively low levels of psychological distress and physical symptoms, regardless of whether they were engaged or disengaged from their job. However when stressors were high, soldiers who were engaged in their jobs reported lower levels of distress compared to soldiers who were disengaged.

## **Psychological well-being and job satisfaction amongst military personnel on unaccompanied tours: The impact of perceived social support and coping strategies**

*Military Psychology*

**Year** 2004 **Author(s)**  
**Vol** 16 Limbert, C.  
**No** 1  
**Pages** 37 to 51

**Method** Survey completed during deployment to Falkland Islands

**Participants** 167 British military personnel

### **Dependent Variables (outcomes)/ Measure / Source**

Psychological well-being      General Health Questionnaire (GHQ-12)      Goldberg, 1972

### **Independent Variables (outcomes)/ Measure / Source**

Coping      COPE scale      Carver et al., 1989  
Perceived social support      Developed by authors  
Job satisfaction      Developed by authors

### **Key Findings**

Most respondents engaged in positive thinking and acceptance as methods of coping with stressors on the unaccompanied posting. Furthermore, these methods of coping were positively associated with psychological well-being, while passive methods of coping (e.g., denial, disengagement, and venting emotions) were related to lower well-being. Further, active coping was also associated with job satisfaction. The most successful active coping strategies, in terms of their impact on job satisfaction, were positive reinterpretation and growth. Low job satisfaction was associated with low psychological well-being. Lower perceived social support was associated with lower job satisfaction and well-being.

The authors noted the importance of encouraging military personnel to adopt more active coping strategies and to improve their perceptions of social support, since these are factors that are important for well-being and job satisfaction on unaccompanied postings in which personnel are away from their home.

**The psychological adaptation of CF augmentees: Effects of personality, situational appraisals, social support, and prior stressors on operational readiness**

*DRDC Technical Report 2004-098*

**Year** 2004

**Author(s)**

Thompson, M. M.

Gignac, M. A. M.

McCreary, D. R.

**Method** Survey

**Participants** 532 Canadian Forces personnel who were completing the basic peacekeeping pre-deployment training course

**Dependent Variables (outcomes)/ Measure / Source**

Indicators of operational readiness

Psychological and physical symptoms	Signs Profile	Based on Derogatis et al., 1974
Commitment to the role of peacekeeper	Adapted from organizational commitment measure	Allen & Meyer, 1996
Commitment to the CF	Adapted from organizational commitment measure	Allen & Meyer, 1996

**Independent Variables (predictors)/ Measure / Source**

Demographic factors (gender, marital status, rank, regular or reserve force membership, previous peacekeeping experience, mission theatre, elemental command)

Individual difference measures

Hardiness	Hardiness Scale	Adapted from Bartone, 1999
Dispositional optimism	Life Orientation Scale – Revised (LOT-R)	Scheier & Carver, 1985
Extroversion	Big Five Inventory	John, 1990
Neuroticism	Big Five Inventory	John, 1990

Situational appraisals

Deployment expectations	Developed by authors
Deployment concerns	Developed by authors

Prior stressors	From HDO survey	Murphy & Farley, 2000
Social support	From HDO survey	Murphy & Farley, 2000

**Key Findings**

It was found that higher levels of optimism, lower neuroticism, fewer deployment concerns, and greater experience with military stressors were associated with fewer symptoms of psychological distress. Commitment to the role of peacekeeper was associated with higher levels of hardiness, extroversion, more positive expectations, and fewer deployment concerns. Commitment to the role of peacekeeper was not predicted by social support or prior military stressors. Higher levels of hardiness, optimism, concerns about deployment, and social support predicted higher commitment to the CF. There were few differences in these variables based on the demographic factors. The results of this research contribute to the understanding of psychological adaptation by identifying individual differences that may buffer against the effects of stressors associated with deployment.

## **Operational tempo and soldier health: The moderating effect of wellness behavior**

*Military Psychology*

**Year** 2005

**Author(s)**

**Vol** 17

Dolan, C. A.

**No** 3

Adler, A. B.

**Pages** 157 to 174

Thomas, J. L.

Castro, C. A.

**Method** Surveys

**Participants** 1,422 U.S. soldiers in Europe

### **Dependent Variables (outcomes)/ Measure / Source**

Depressive symptoms	CES-D	Radloff, 1977
General psychological health	General Health Questionnaire (GHQ)	Goldberg, 1972
Physical health	Physical Symptoms Scale (PSS)	Britt & Adler, 1999

### **Independent Variables (predictors)/ Measure / Source**

Optempo (workload)	Self-reported work hours/day in the past week
Physical exercise (moderator)	Self-reported number of times per week did physical exercise
Sleep (moderator)	Self-reported hours of sleep/night in the past week
Alcohol use (moderator)	Self-reported number of alcoholic drinks/week

### **Key Findings**

Physical exercise moderated the impact of work hours on depressive symptoms and general psychological health, but not on physical health. That is, when work hours were long and soldiers exercised less, psychological health was low. However, when work hours were long and soldiers exercised more, psychological health was high.

Sleep also had a moderating effect on both physical and psychological health outcomes. Indeed, when work hours were long and soldiers slept less, physical and psychological health were poor. In contrast, when work hours were long and soldiers slept more, soldiers experience better health. Low levels of alcohol use moderated the effects of work hours on physical symptoms only when work hours were short. That is, longer work hours was associated with higher levels of physical symptoms, but this relationship was attenuated when alcohol use was low. However, when work hours were very high, this relationship was no longer significant.

## **Extending and applying the demand-control model: The role of soldier's coping on a peacekeeping deployment**

*Journal of Occupational Health Psychology*

**Year** 2005

**Vol** 10

**No** 4

**Pages** 452 to 464

**Author(s)**

Ippolito, J.

Adler, A. B.

Thomas, J. L.

Litz, B. T.

Holzl, R.

**Method** Surveys administered in garrison 30 days before deployment and during a six-month peacekeeping tour in Kosovo

**Participants** 638 U.S. soldiers from a brigade stationed in Germany

### **Dependent Variables (outcomes)/ Measure / Source**

General psychological health    General Health Questionnaire (GHQ)    Goldberg, 1972

### **Independent Variables (predictors)/ Measure / Source**

Job Control                            Job Control Scale                            Hackman & Oldham, 1975

Coping                                    Coping Scale                                    Harnish, Aseltine, & Gore, 2000

Demands                                Deployment Stressors Scale                                Adler et al., 2001

### **Key Findings**

The authors hypothesized that greater perceptions of job control (i.e., the ability to exert influence in the work environment) buffered the demand-strain relationship when individuals used active coping, and exacerbated the relationship when individuals used passive coping. It was found that job control buffered the relationship between demands and psychological health, but only when soldiers used active coping. That is, individuals who exhibited high levels of job control were less likely to experience a decline in psychological health under high-stress conditions when they used active coping styles to deal with stress. However, job control did not function as a moderator in the demands-health relationship when passive coping or religious coping were used. Thus, the use of active coping strategies can affect the influence of job control on the stressor-health relationship. Increasing perceptions of job control, and encouraging use of active coping strategies to deal with stressors, are possible areas of focus for maintaining the health and well-being of military personnel during deployment.

### **Notes**

Pre-deployment psychological health was statistically controlled for by entering it in the first step of each hierarchical regression as a covariate.

## **Stress and performance: A review of the literature and its applicability to the military**

*Rand Corporation, Arlington VA*

**Year** 2005

**Author(s)**

Kavanagh, J.

**Method** Literature review

### **Key Findings**

This report discusses the stressor-strain relationship, and factors that can moderate this relationship.

Deployment-related stressors associated with both peacekeeping and combat operations include uncertainty, long work hours, risk of death or disease, boredom, and separation from family. In combat operations, risk of death or personal injury and threat of hostile fire are much higher than during peacekeeping. In addition to deployment stressors, there are also stressors involved in military life at the home base, including long work hours.

Stress and performance are related most often through an inverted U-shaped model, such that performance on a task will be lowest at both high and low levels of stress, and optimal at moderate levels. High levels of individual stress consistently lead to narrow perceptions used to make decisions, slow cognition, and reduced performance overall. Group functioning also decreases with higher levels of stress.

Stress moderators include personality characteristics (e.g., individuals with high anxiety/stress reactivity, and those with a Type A personality who are more responsive to stressors), anticipation of the stressor, individual factors (rank, ethnicity, socioeconomic status), feelings of self-efficacy, control/uncertainty, training, leadership, and group cohesion. The most important moderator in the military context is stressor exposure training, in which individuals are exposed to stressors and learn to perform their skills effectively under such conditions.

## **Military hardiness as a buffer of psychological health on return from deployment**

*Military Medicine*

<b>Year</b>	2006	<b>Author(s)</b>
<b>Vol</b>	171	Adler, A. B.
<b>No</b>	2	Dolan, C. A.
<b>Pages</b>	93 to 98	

**Method** Surveys administered during and after a peacekeeping deployment. Moderated regression analyses were used to assess the moderating effects of hardiness on the stressor-health relationship.

**Participants** 629 U.S. Soldiers

### **Dependent Variables (outcomes)/ Measure / Source**

Psychological Health	CES-D	Radloff, 1977
Physical Health	Physical Symptoms Scale	Britt & Adler, 1999

### **Independent Variables (predictors)/ Measure / Source**

Military Hardiness	Military Hardiness Scale	Developed by authors
Stressors	Deployment Stressor Scale	Bartone et al.1998

### **Key Findings**

Higher levels of hardiness (i.e., level of involvement in life activities [commitment], ability to exercise judgement [control], and ability to perceive change as beneficial [challenge]) were associated with lower depression at both time points (during and after the deployment). Hardiness was not related to physical health. Hardiness interacted with deployment stressors to predict depression after deployment. That is, among soldiers who experienced high levels of stressors on the deployment, those who were high in hardiness had lower levels of depression when assessed post-deployment compared to those who were low in hardiness. Hardiness thus acted in a protective capacity in attenuating the psychological distress symptoms associated with stress. The authors noted that the failure of hardiness to buffer against physical symptoms was in contrast to some previous studies.

## Effects of PERSTEMPO on morale in the Canadian Forces

DRDC CORA TM 2008-18. Department of National Defence, Ottawa, Canada

Year 2008

Author(s)

Sudom, K.

Pepin, K.

Dursun, S.

Method Survey

Participants 4,003 CF Regular Force members

### Dependent Variables (outcomes)/ Measure / Source

Morale

Walter Reed Army Institute of Research

### Independent Variables (predictors)/ Measure / Source

Workload

Developed for survey

Job stress

Reduced version of the Index of Job-Related Tensions in Organizations

Kahn, 1964

Horizontal cohesion

Podsakoff & MacKenzie, 1994

Vertical cohesion

Marlowe et al. (1985); Vaitkus (1994)

Coping

Halverson et al., 1995

### Key Findings

The objective of the study was to assess the effects of PERSTEMPO (i.e., workload and job-related tensions) on morale in the CF and identify potential variables that may moderate or buffer these effects. In this regard, the effects of job-related tensions on morale were moderated by cohesion as well as career-enhancing aspects of perstempo. Specifically, the negative effects of job tensions on perceived morale in one's unit were attenuated if members experienced high levels of cohesion in their unit, and cohesion with their supervisors or if members were satisfied with aspects of their career (e.g., the promotion system). Coping was directly related to morale, but it did not moderate the effects of job stress. Further, although increased financial satisfaction and coping (greater use of active coping, and less use of passive coping) were directly related to higher morale, these variables did not act as moderators. Identifying factors that influence the relationship between stressors and morale is important for the development of programs and interventions involved in increasing the performance of military personnel. Efforts top improving morale may have implications for retention, effectiveness, and performance.

### 3.1.6.2 Group/Organizational Level

#### **Role clarity, work overload, and organizational support: Multilevel evidence of the importance of support**

*Work & Stress*

<b>Year</b>	2000	<b>Author(s)</b>
<b>Vol</b>	14	Bliese, D.
<b>No</b>	1	Castro, C. A.
<b>Pages</b>	65 to 73	

**Method** Survey

**Participants** 1,786 lower enlisted U.S. Army soldiers

#### **Dependent Variables (outcomes)/ Measure / Source**

Psychological strain    General Severity Index of Brief Symptom Inventory    Derogatis & Melisaratos, 1983

#### **Independent Variables (predictors)/ Measure / Source**

Demands	Role Overload Scale	From Michigan Organizational Assessment Questionnaire (Cammann et al., 1983)
Role clarity	Role Clarity Scale	From Michigan Organizational Assessment Questionnaire (Cammann et al., 1983)
Organizational support	3 items	Derived from vertical cohesion scale Marlowe et al., 1985

#### **Key Findings**

The study sought to examine whether role clarity would moderate the relationship between demands and psychological strain, and whether this relationship depended on support from leaders. Results indicated that there was a three-way interaction between demands, role clarity, and support. That is, high role clarity reduced the effects of high work overload on psychological strain, but only among soldiers who reported having supportive leadership.

# **A multi-level, longitudinal study of the strain reducing effects of group efficacy, group cohesion, and leader behaviors on military personnel performing peacekeeping operations**

*Doctoral Dissertation, Florida State University, U.S.*

**Year** 2003

**Author(s)**

Lewis, S. J.

**Method** Surveys administered in theater (Kosovo) and 1-2 months after returning from Kosovo

**Participants** 546 U.S. military personnel

## **Dependent Variables (outcomes)/ Measure / Source**

Individual-level strain      General Health Questionnaire (GHQ-12)      Goldberg, 1972

## **Independent Variables (predictors)/ Measure / Source**

Operational stress	Mission Attitudes Scale (MAS)	Walter Reed Army Institute of Research (WRAIR)
	Peacekeeping Events Scale (PES)	WRAIR
	Family Well-being	WRAIR
Unit-level predictors	Cohesion scale	Revised version of Podsakoff & MacKenzie, 1994
	Leader behaviours	WRAIR
	Collective efficacy	WRAIR

## **Key Findings**

The researcher examined whether perceived operational stress at mid-deployment would be positively related to psychological distress at post-deployment, and whether ratings of leader behaviour, unit cohesion, and collective efficacy at mid-deployment would moderate the relationship between operational stressors and psychological distress. Mission ambiguity was positively related to psychological distress, although exposure to traumatic events was not. Two explanations for this lack of effect were provided. First, after returning home, soldiers' social support networks may have alleviated the impact of the potentially traumatic events. Second, the deployment environment in Kosovo may have been contextually different than that in other studies (e.g., soldiers in Kosovo rarely reported being under fire in comparison to those from Somalia or Bosnia theatre). Family separation was also not associated with post-deployment distress, although it was associated with distress at mid-deployment.

Higher ratings of leadership were associated with lower psychological distress. In addition, there was relationship between unit cohesion and psychological well-being, or between collective efficacy and well-being. In addition, there was no evidence of a moderating effect of operational stress or organizational characteristics in the relationship between operational stressors and post-deployment psychological stress.

## **How leaders can influence the impact that stressors have on soldiers**

*Military Medicine*

**Year** 2004

**Vol** 169

**No** 7

**Pages** 541 to 545

**Author(s)**

Britt, T.

Davison, J.

Bliese, P. D.

Castro, C. A.

**Method** Literature review

### **Key Findings**

The paper reviewed the available literature on leadership and well-being in order to demonstrate how leadership can protect against the adverse effects of stressors. The report focuses on two categories of leader behaviour: path-goal clarifying behaviours (e.g., actions which clarify standards by which subordinates will be judged) and supportive leader behaviours (e.g., showing concern for subordinates' welfare). Leadership can affect the relationship between stressors and outcomes in several ways, either by directly influencing the stressors that soldiers experience, by acting as a buffer between stressors and outcomes, or by affecting other variables that can buffer against the adverse effects of stressors.

# The relationship between perceived organizational and cultural support and soldiers' post-deployment symptoms

DRCD Toronto

Department of National Defence, Ottawa, CA

Year 2006

Author(s)

Pickering, D. I.

**Method** Surveys administered two months after returning from deployment in Bosnia

**Participants** 202 Canadian Forces soldiers

## Dependent Variables (outcomes)/ Measure / Source

Symptoms	SIGNS	Dobрева-Martinova, 1998a
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## Independent Variables (predictors)/ Measure / Source

Levels of Stress	Stress and Military Service Questionnaire (SMSQ)	Farley, 1995; Dobрева-Martinova, 1998b
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Perceived Cultural and Organizational Support	Homecoming Issues survey	Developed by authors
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## Key Findings

Greater amounts of work stress were associated with increased symptoms of physical and psychological distress. Higher levels of combat stress were also associated with increased levels of these symptoms. Neither family-concerns stressors nor service-/career-issues stressors were related to post-deployment symptoms.

There was no main effect of societal or organizational support on post-deployment symptoms. That is, higher levels of perceived organizational support (i.e., unit, CF, government) and Canadian society support were not associated with reduced post-deployment symptoms. Although this contrasts with some previous research, the author notes that prior studies have predominantly focused on more severe outcomes such as PTSD, rather than the less severe health and well-being outcomes examined in this study. The author suggests that perceived organizational and cultural support may be more important for more severe symptoms of psychological distress.

There was also no evidence to corroborate the hypothesis that social support may play a stress-buffering role. That is, neither perceived organizational nor societal support were able to reduce the negative effects of high work stress, service-/career/issue stress, combat stress, or family concerns stress on post-deployment symptoms. The authors note that most participants in the study reported relatively low levels of stress from combat and family concerns, and only moderate levels of stress from work or career issues. Thus, there may not have been enough participants experiencing high levels of stress to adequately test a stress-buffering hypothesis.

## 4. Discussion

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Perstempo, the demands military service places on its members, may have impacts at the individual, family, and organizational levels. This annotated bibliography provided an overview of the review papers and research studies conducted both in the CF and other military research organizations on the effects of personnel tempo (including optempo or the pace of military operations, time away, and workload) on important individual, family, and organizational outcomes, and variables that may buffer or exacerbate these outcomes.

In general, soldiers who deployed frequently and/or for longer periods tended to report higher levels of adverse outcomes at the personal and family level (e.g., in terms of mental health symptoms, morale, marital difficulties, reenlistment decisions, motivation) than those who deployed less frequently or for shorter periods. Furthermore, greater exposure to adverse events while on deployment was associated with greater mental health symptoms of psychological distress. Deployment-related stressors that can impact negatively on personnel include uncertainty, long work hours, risk of death or disease, boredom, and separation from family. The magnitude and type of stressors experienced differed across the cycle of deployment. Higher levels of stress were generally found in the pre-deployment phase compared to during- or post-deployment. In the pre-deployment phase, the stressors experienced focused around family and preparing to deploy. During deployment, soldiers reported issues surrounding workload, confined living quarters, boredom, and separation from family, as well as combat experiences. Finally, following deployment, mental health and problems with alcohol were issues for some soldiers. In addition to deployments, workload in garrison and time away for non-deployment related reasons had a negative impact on personnel (e.g., in terms of career intentions and individual well-being). Although most of the research identified was based on Regular Force personnel, there was some evidence for more difficulties among Reserve Force members. In particular, UK Reserve Force personnel reported more difficulties readjusting following a deployment, in comparison to their Regular Force counterparts. As well, differences in adjustment may vary depending on the type of unit one is a part of. For example, psychological distress was found to be higher among infantry soldiers in comparison to those in other types of units.

In addition to its impacts at the individual and family level, deployments were found to have both positive and negative effects on organizational outcomes. Although having one or two deployments had positive effects on reenlistment, it appears that having a greater number of deployments, particularly those of a hostile nature, can adversely affect reenlistment decisions. Furthermore, although the length and frequency of deployments are important factors affecting retention, specific aspects of deployments, such as perceived support from superiors, and ability to find meaning and challenge in one's work, may be of even greater importance. Expectations also play an important role, in that individuals who are away longer than expected tend to report more negative outcomes (e.g., work stress, lower intentions to remain in the military). Other broader factors such as family concerns and conflict between work and family life can also affect decisions to stay or leave.

Several moderators of the effects of military stressors on adverse outcomes were examined in the studies, including individual variables (e.g., hardiness, prior stressors, active coping strategies, training), group variables (e.g., unit cohesion, support from friends), as well as organizational-level factors (e.g., perceived support from the organization, quality of leadership). It is evident from these studies that such factors may protect against the negative effects of stressors associated with military service. In the current environment of increasing operational tempo, it is critical to identify the factors that may alleviate some of the impacts of the increased demands of military service on personnel.

With high intensity deployments like the one in Afghanistan, issues of perstempo will become

increasingly important. The effects of perstempo on military personnel, their families, and the military organizations will become increasingly evident. Learning from past studies and experiences is crucial. Clearly, many military members value deployments (e.g., in terms of the financial gain and opportunity to use their training in real situations). However, negative consequences can result from high demands. By identifying the costs and benefits of operating in a high perstempo environment, the specific areas for intervention to enhance members and family well-being could be targeted.

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Personnel tempo (perstempo), the demands military service places on its members, can have impacts at the individual, family, and organizational levels. This annotated bibliography provides an overview of the review papers and research studies conducted both in the CF and other military research organizations on the effects of personnel tempo (including optempo or the pace of military operations, time away, and workload) on important individual, family, and organizational outcomes, and variables that may buffer or exacerbate these outcomes. The research suggests that frequent and longer deployments, as well as those of a more hostile nature, tend to be associated with more adverse outcomes. The types of stressors experienced by military members vary throughout the deployment cycle, and some reports have indicated that experiences vary depending on factors such as type of unit and reserve versus regular force status. Despite the evidence for the negative impacts of high perstempo, it appears that if time away is not excessive, deployments can have a positive effect on retention, in that they allow personnel to put their skills and training to use. In addition, researchers have identified a number of factors that may buffer individuals against the negative impacts of stressors associated with military service, such as adaptive coping styles. Although length and frequency of deployments can play a critical role in determining whether adverse outcomes will become evident, other factors, such as perceived support from superiors, may also be important. With high intensity deployments like the current one in Afghanistan, issues of perstempo will become increasingly important. The effects of perstempo on military personnel, their families, and the military organization will become increasingly evident. Learning from past research, such as that identified in the present report, is an important step in identifying the costs and benefits of operating in a high perstempo environment.

La fréquence de déploiement du personnel, qui constitue une exigence du service militaire, peut avoir une incidence sur le militaire, sa famille et l'organisation. Cette bibliographie commentée donne un aperçu des articles de synthèse et des études menées par les FC et des organismes militaires de recherche sur les effets majeurs de la fréquence de déploiement du personnel (dont le rythme opérationnel ou le rythme des opérations militaires, la période d'absence et la charge de travail) pour le militaire, sa famille et l'organisation ainsi que sur les facteurs atténuants ou amplificateurs. Les études suggèrent que les déploiements fréquents et de longue durée ainsi que ceux dans un environnement hostile semblent entraîner des conséquences plus néfastes. Le type d'agents stressants avec lesquels doivent composer les militaires varie durant le cycle de déploiement. Certains rapports ont indiqué que les expériences personnelles varient selon certains facteurs tels que le type d'unité et le statut de réserviste ou de membre de la Force régulière. Malgré les éléments probants de conséquences néfastes dues à une fréquence élevée de déploiement du personnel, il semble que si la période d'absence n'est pas trop longue, le déploiement peut avoir un effet positif sur la conservation de l'effectif étant donné que le déploiement permet aux militaires de mettre leurs compétences et leur instruction à profit. En outre, des chercheurs ont identifié certains facteurs qui peuvent atténuer les répercussions négatives des agents stressants liés au service militaire, par exemple de bonnes capacités d'adaptation. Bien que la longueur et la fréquence des déploiements semblent jouer un rôle déterminant pour établir s'il y aura des conséquences néfastes, d'autres facteurs, notamment le soutien perçu des supérieurs, peuvent également s'avérer importants. En raison des déploiements dans le cadre d'opérations de haute intensité comme celles en Afghanistan, les questions liées à la fréquence de déploiement du personnel revêtent une importance encore plus grande. L'incidence de la fréquence de déploiement du personnel sur les militaires, leur famille

et les organisations militaires deviendra de plus en plus évidente. Tirer profit des recherches antécédentes, telles que celles énoncées dans le rapport, constitue une étape essentielle pour déterminer les coûts et les avantages d'évoluer dans un environnement où la fréquence de déploiement du personnel est élevée.

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- optempo
- quality of life
- deployment
- well-being
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