



OPEN ACCESS

Psychology, risk, health and deployed military operations

Neil Verrall

Correspondence to

Neil Verrall, Human and Social Science Group, Defence Science and Technology Laboratory, Salisbury SP4 0JQ, UK; ngverrall@dstl.gov.uk

Received 20 August 2018
Revised 29 September 2018
Accepted 2 October 2018
Published Online First
30 November 2018

ABSTRACT

This article will focus on a study by the UK Defence Science and Technology Laboratory (Dstl) which investigated the risk propensity and health behaviours of UK army personnel deployed to Iraq in 2007 as part of Op TELIC. The study addressed the concept of impulsive sensation seeking and how this interacted with health behaviours associated with alcohol, smoking, driving and sex at predeployment, during deployment and postdeployment, as well as perceptions of risk and psychological well-being. There is also a description of other deployment-related risk and health research and analysis undertaken by Dstl as part of a wider discussion on the nature of both risk and health on deployed operations.

INTRODUCTION

The Defence Science and Technology Laboratory (Dstl) was formed in 2001, and the first formal request for human science knowledge and operational health was as part of a study addressing the initial warfighting phase of the UK's military contribution to the coalition operation in Iraq (Op TELIC) in 2003,¹ which included addressing both nutrition and fatigue. As the war in Iraq intensified and pertinent lessons were being identified, psychology-based support to operations was required from within the Dstl human capability domain; this included aspects related to risk as well as health. Risk is a natural, and expected, part of war. The word 'risk' is mentioned 22 times within various parts of the UK's current Defence Doctrine (JDP 0-01),² and historically it was discussed in Von Clausewitz's seminal treatise *On War*³ through his concept of *Boldness*:

But this noble impulse, with which the human soul raises itself above the most formidable dangers, is to be regarded as an active principle peculiarly belonging to war. In fact, in what branch of human activity should boldness have a right of citizenship if not in war? From the transport-driver and the drummer up to the general, it is the noblest of virtues, the true steel which gives the weapon its edge and brilliancy.

Sensation seeking and health

Sensation seeking is a personality trait that can best be described as a biopsychosocial-biochemical model of how people seek or avoid physiological and psychological sensation, which can broadly be called risk-taking or risk avoidance (ie, those wanting more sensation take more risks).⁴ Half a century of research on civilian samples has consistently demonstrated differences in a range of behaviours (including health behaviours) between

Key messages

- ▶ Not all military personnel are high sensation-seeking risk-takers. There are variations in risk propensity, perceptions of risk and types of behaviours than many would assume.
- ▶ The topic of sensation-seeking and risk-taking can be applied to many areas of military behaviour and performance, not just the health domain.
- ▶ The numerous contextual factors that affect the perception and behaviour of military personnel across the deployment cycle require deeper consideration.
- ▶ There is a need for more (and better) longitudinal studies that capture and understand behaviour at pre-, during and post-deployment.
- ▶ Mixed methods studies that gather quantitative and qualitative data provide greater insight and understanding; especially in complex areas such as deployed military operations.

high and low sensation seekers; however, impulsive sensation seeking (ImpSS),⁵ which was the latest theoretical development in the study of sensation seeking, had not previously been reported within a military population. This is important because the military personnel are our greatest asset in terms of military capability, and approaches to risk-taking can affect that capability in terms of preventable health-compromising behaviours that contribute to disease and non-battle injuries, as well as direct battle casualties.^{6,7} Therefore, it is necessary to care for and protect our human capability up to the operational point of absolute necessity.

METHODS

A longitudinal, repeated-measures study collected questionnaire data (quantitative and qualitative) among a brigade of UK army personnel across the phases of Op TELIC 10.⁸ A sample within one Mechanised Brigade returned questionnaires at predeployment (n=1374), mid-deployment (n=889) and postdeployment (n=537). Using tertile ratios established at predeployment, the participants were categorised into either high ImpSS (H-ImpSS) or low ImpSS (L-ImpSS) groups. Due to the complicated nature of risk and behaviour, a number of other variables were addressed, which included perceptions of operational risk, risky health behaviours (alcohol, smoking, driving and sex) and psychological well-being (PWB). The sensitive nature of

Check for updates

© Crown copyright (2019), Dstl.

To cite: Verrall N. *J R Army Med Corps* 2019;**165**:116–119.



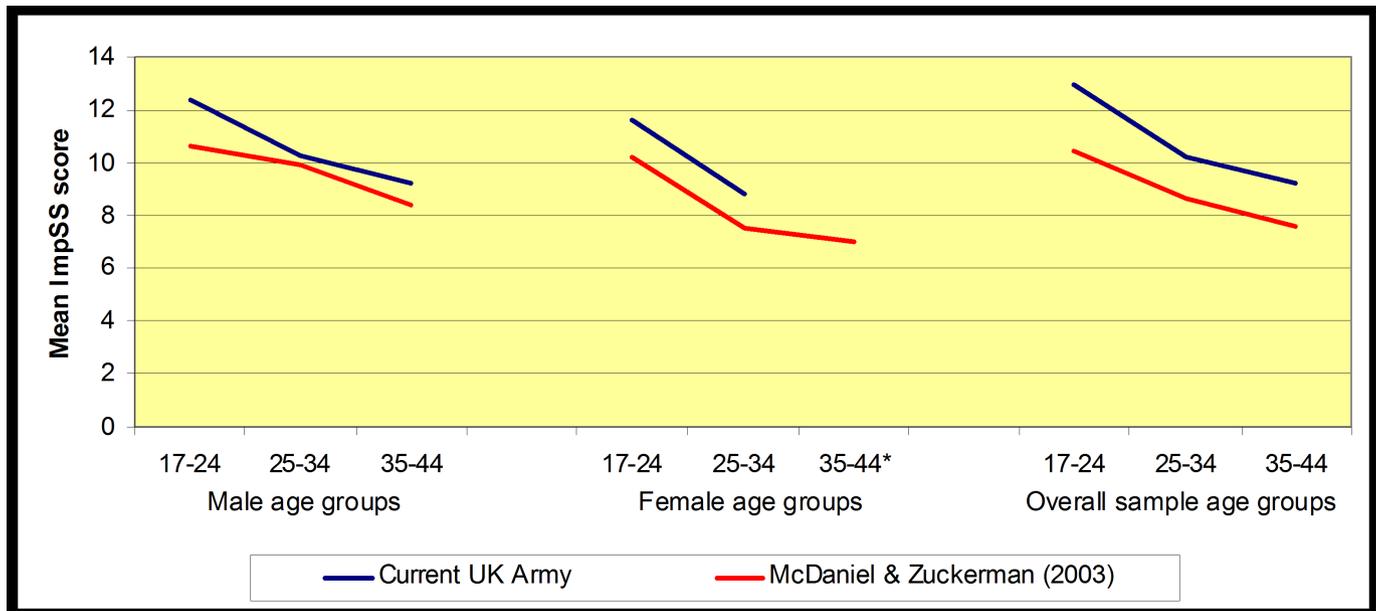


Figure 1 Comparison of mean ImpSS by age groups. *Denotes no female data for the 35–44 age group. ImpSS, impulsive sensation seeking.

disclosing risky health behaviours was carefully considered at the design phase of the study, and appropriate moral and ethical considerations were resolved via the army's scientific advisory committee, which led to approval from the Ministry of Defence (MOD) Research Ethics Committee. A range of inferential statistics and modelling statistics were conducted on the quantitative data, while content analysis and thematic analysis were conducted on the qualitative data.^{9 10}

RESULTS

Levels of ImpSS were statistically higher in the study's UK army sample than in reported civilian data from previous research¹¹ (Figure 1). Levels of ImpSS were significantly higher for combat arms as opposed to combat service and combat service support arms, even after controlling for age and gender, suggesting that the nature of combat arms attracted those higher in sensation seeking (Figure 2). Consistent with

previously published literature, the H-ImpSS group tended to smoke (and smoke more), drink more alcohol, drive faster, wear seat belts less and engage in risky sexual behaviour more than those in the L-ImpSS group (Table 1). Additionally, the H-ImpSS group consistently displayed lower risk perceptions of the operational context across all phases of the deployment compared with the L-ImpSS group, while no clear pattern emerged for PWB.

The research also collected a large amount of qualitative data (ie, 4326 responses categorised into various themes across alcohol, smoking and sex for predeployment, during deployment and postdeployment). Further indepth analysis of these findings would provide insights into the numerous and complicated reasons that military personnel give for their health-related behavioural decisions related to the deployment cycle, which include positive changes, negative changes or no changes. As an example, Table 2 presents the top 10 reasons for perceived

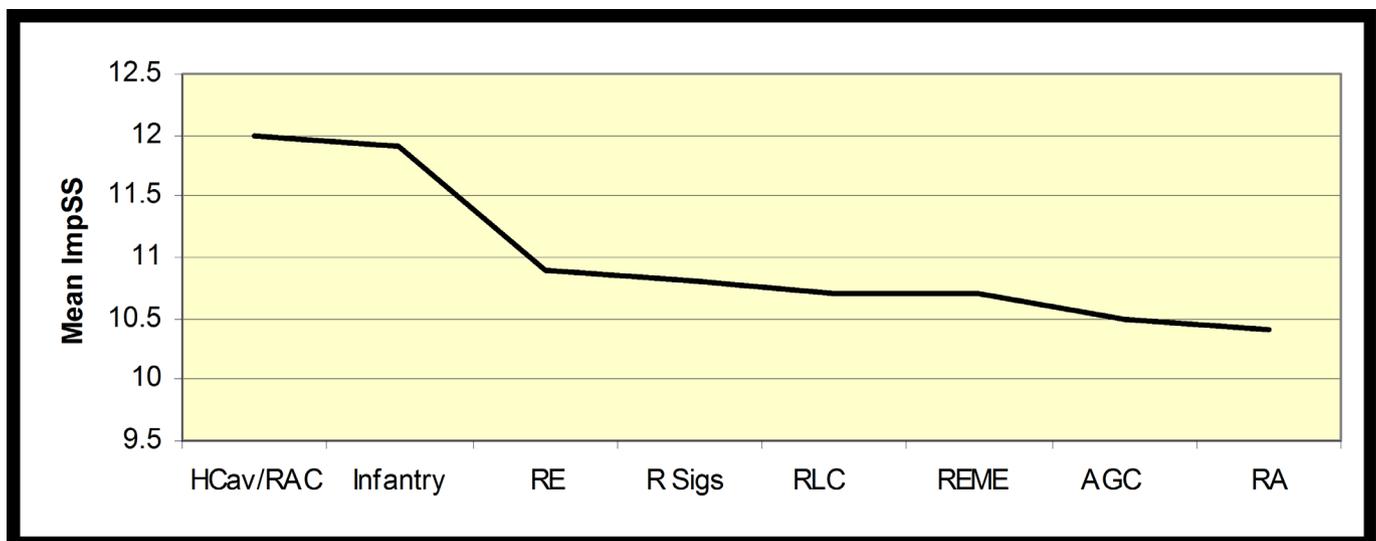


Figure 2 Mean ImpSS by army unit. ImpSS, impulsive sensation seeking. Household Cavalry (HCav), Royal Armoured Corps (RAC), Royal Engineers (RE), Royal Signals (RSigs), Royal Logistical Corps (RLC), Royal Electrical and Mechanical Engineers (REME), Adjutant's General Corps (AGC), Royal Artillery (RA).

Table 1 Comparison of ImpSS groups on health behaviours at predeployment

Health behaviours (T1)	Mean (SD) H-ImpSS	Mean (SD) L-ImpSS	t	df	Significance (p)	Effect size (r)
Alcohol						
Frequency of alcohol	3.16 (1.3)	2.73 (1.3)	-5.49	1050	<0.001	0.17
Amount of alcohol	3.97 (2.1)	3.02 (1.9)	-7.69	1035	<0.001	0.23
Frequency of HED (binge)	2.49 (0.85)	2.08 (0.96)	-7.179	1013	<0.001	0.22
Current perception of intake	0.16 (1.0)	0.01 (0.88)	-2.59	1030	<0.01	0.08
Smoking						
Daily smoking rate	13.15 (8.7)	11.27 (8.9)	-2.69	649	<0.01	0.11
Current perception of behaviour	0.24 (0.75)	0.19 (0.78)	-0.732	527	NS	0.03
Driving						
Speed in built-up area	1.71 (0.65)	1.47 (0.58)	-5.87	931	<0.001	0.19
Speed on motorway	2.08 (0.65)	1.79 (0.65)	-6.96	925	<0.001	0.22
Seatbelt use in front as passenger	0.63 (1.0)	0.33 (0.78)	-5.47	1015	<0.001	0.17
Seatbelt use in rear	1.43 (1.4)	1.07 (1.3)	-4.33	1069	<0.001	0.13
Sex						
Age at first intercourse	14.9 (1.7)	15.8 (2.3)	6.1	902	<0.001	0.20
Condom use (for single group only)	1.96 (1.2)	1.61 (1.2)	-2.64	377	<0.01	0.13
One-night stands	1.53 (1.2)	0.80 (1.0)	-10.41	1052	<0.001	0.31
Pay for sex	0.38 (0.74)	0.22 (0.63)	-3.76	1051	<0.001	0.12
Contracted an STI	0.39 (0.71)	0.24 (0.59)	-3.87	1043	<0.001	0.12
Current perception of behaviour	0.57 (1.1)	0.32 (1.0)	-3.95	1061	<0.001	0.12
Amount of sex in the last 2 months	22.3 (24.8)	18.9 (20.4)	-2.26	877	<0.05	0.08

HED, Heavy Episodic Drinking; H-ImpSS, high ImpSS; ImpSS, impulsive sensation seeking; L-ImpSS, low ImpSS; STI, Sexually Transmitted Infection.

Table 2 The top 10 reasons for perceived behaviour change for alcohol consumption

		Top 10 qualitative reasons for perceived change in alcohol use		
		Increase	Decrease	No change
Predeployment	1	Socialising with friends/family.	Improve/maintain fitness/health.	Enjoy self/social reasons.
	2	No alcohol on ops/will miss it.	Not enough (less) time/too busy.	Normal life/no need to change.
	3	Last chance for fun before tour.	Quality time with family.	Good time before we deploy.
	4	Might die/might be last chance.	To wean off (cut down) alcohol intake.	Don't drink much anyway.
	5	Worries about the tour.	Don't drink much anyway.	Am not worried about the deployment.
	6	Stress.	To keep mind clear and focused.	To relax.
	7	Enjoy life while you can.	Job-related need to cut down.	To moderate (control) behaviour.
	8	Worried about leaving family.	To prepare for deployment.	Job-related workload and stress.
	9	Cohesion with colleagues.	Gone off drinking/lost interest in alcohol.	Lost interest/not concerned about intake.
	10	To relax/calm nerves.	Saving money.	Too busy to drink more.
During deployment	1	Not had it in a while, miss it.	Not allowed (policy).	Rarely drink at home.
	2	Stress.	Affects professionalism and job performance.	Work hard, play hard.
	3	Depressed.	Dehydration and hot environment.	Access to alcohol in theatre.
	4	Drank on Rest and Recuperation (R&R).	Can live without it.	Because I can.
	5	Work pressures.	Am missing it.	To avoid boredom.
	6	Didn't drink much at home.	Long work hours, lack of time.	Social aspects.
	7	Boredom.	Can't get hold of it (access).	Being on tour hasn't affected me.
	8		I don't drink on tour.	I know my limits.
	9		Positive health reasons.	
	10		Don't drink much anyway.	
Postdeployment	1	Stress (general).	Don't need it, don't want it.	Socialising.
	2	Socialising more.	For fitness and health.	Back to normal, no change.
	3	Missed it/enjoy it.	Family reasons (marries, new baby and so on).	Enjoy it.
	4	Boredom.	Lost the taste on tour.	No need to drink more.
	5	To aid sleep.	Cost (saving money, too expensive).	Not a big drinker.
	6	Fragile life, live to the max.	In a new unit, current workload.	Family reasons.
	7	To relax.	Drank too much before tour.	To relax.
	8	I feel happier, fewer worries.	Have other activities.	Back to normal after initial binge.
	9	To avoid thinking and feelings.	Personal issues (control stress).	Because I can.
	10	Stress (work).	Not a big drinker.	Don't think about how much I drink.

behaviour change in alcohol consumption across the deployment cycle.

DISCUSSION

This study was the first of its type, both nationally and internationally, not just for looking at the ImpSS personality in a military population but because it also collected data *during* an operation as well as the traditional predeployment and postdeployment studies. The research not only highlighted the complexity and range of behaviours across the deployment cycle but can help to predict the behavioural patterns of sensation seekers, who are often referred to as 'risk takers' and who may account for disproportionate ratios in terms of disease and non-battle injuries. This study led to a number of exploitation opportunities, for example, the UK contribution to a North Atlantic Treaty Organisation (NATO) research group,¹² published papers and conference^{13–15} and a PhD in health psychology.¹⁶ The findings also helped to inform Defence policy groups such as the Defence Road Safety Committee and the Defence Health Strategy Working Group.

Other related research

There have also been a range of other Dstl projects and activities that either concurrently or subsequently addressed operational health and behaviour; for example, measures of ImpSS were also collected as part of a study addressing operational rations in Afghanistan (Op HERRICK)¹⁷; risky behaviour associated with the Indirect Fire drill was analysed by operational analysts deployed to Iraq; and risk was discussed in relation to countering improvised explosive devices during Op HERRICK.^{18–20} In terms of health and behaviour, collaborative research was conducted between Dstl and the Institute of Naval Medicine on Op HERRICK,^{21 22} which included focus groups on eating behaviour and health issues. Finally, as part of operational analysis on Op HERRICK, drinking behaviour associated with potable water was investigated, as was the use of dining facilities.²³

CONCLUSION

Psychology-based advice, support and research have made a significant contribution to worldwide operations in the last 15 years. This is likely to continue in the future, especially if the military find themselves operating in environments that have been described as congested, cluttered, contested, connected and constrained,²⁴ and where appreciating psychology and behaviour will be as important to the deployed force as a whole as it will for specific medical mitigation and intervention.

Correction notice This article has been corrected since it was published Online First. The copyright license was changed and the article was made Open Access.

Contributors NV is the sole author and contributor.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Obtained.

Ethics approval MOD Research Ethics Committee.

Provenance and peer review Commissioned; externally peer reviewed.

Open access This material is licensed under the terms of the Open Government Licence except where otherwise stated. To view this licence, visit <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3> or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: psi@nationalarchives.gov.uk

REFERENCES

- Verrall N, Bowditch S, Rogers A. *Human sciences aspects from Op TELIC: a final report of lessons identified. DSTL/TR09560*, 2004.
- Ministry of Defence. *UK defence doctrine (DDP 0-01)*. 5 edn. Shrivenham, Oxon: UK DCDC, 2014.
- Von Clausewitz C. *On War*. Hertfordshire: Wordsworth Editions Limited, 1997.
- Zuckerman M. *Sensation seeking and risky behaviour*. Washington, DC: American Psychological Association, 2007.
- Zuckerman M. Chapter 16: Zuckerman-Kuhlman Personality Questionnaire (ZKPQ). In: De Raad B, Perugini M, eds. *An alternative five-factorial model big five assessment*. Seattle, WA: Hogrefe & Huber, 2002.
- Allison-Aipa TS, Ritter C, Sikes P, et al. The impact of deployment on the psychological health status, level of alcohol consumption, and use of psychological health resources of postdeployed U.S. Army Reserve soldiers. *Mil Med* 2010;175:630–7.
- Bell NS, Amoroso PJ, Yore MM, et al. Self-reported risk-taking behaviors and hospitalization for motor vehicle injury among active duty army personnel. *Am J Prev Med* 2000;18(3 Suppl):85–95.
- Verrall NG. *The role of risk in the health behaviours of military personnel in the UK armed forces: final customer report. DSTL/CR33456*, 2009.
- Coolican H. *Research methods and statistics in psychology*. 3rd edn. London: Hodder & Stoughton, 1999.
- Field A. *Discovering statistics using SPSS*. 2nd edn. London: SAGE Publications Ltd, 2005.
- McDaniel SR, Zuckerman M. The relationship of impulsive sensation seeking and gender to interest and participation in gambling activities. *Pers Individ Dif* 2003;35:1385–400.
- NATO. *Psychological aspects of health behaviours of military personnel in deployed military operations. Final report prepared by NATO HFM RTG-164*, 2011.
- Meijer M, Verrall NG. *Alcohol use and military performance*. Sofia, Bulgaria, 2009.
- Verrall NG. A review of military research into alcohol consumption. *J R Army Med Corps* 2011;157:164–9.
- Verrall NG. *The role of risk in the health behaviours of military personnel in the UK armed forces. DSTL/CP70594*. Porton, Wiltshire: Dstl Porton Down, 2012.
- Verrall NG. *The role of risk in the health behaviours of military personnel in the UK armed forces*, 2011.
- Verrall NG, Wood PM. *Evaluation of the UK operational ration pack on Op HERRICK 8. DSTL/TR32020*, 2008.
- Verrall NG, Taylor A. *CIED Detection: exploratory investigation of combat indicators. DSTL/CR41207*, 2010.
- Verrall NG. *Improving our understanding of IED combat indicators and ground sign awareness for C-IED. DSTL/CR51852*, 2011.
- Verrall NG. *Catalogue of Dstl studies involving human aspects of CIED 2006-11. DSTL/CR51583*, 2011.
- Delves SK, Fallowfield JL, Nevola VR. *Surgeon general's armed forces feeding project operational feeding in military personnel: interim report II (Mid-Deployment). INM Report No. 2010.015*. Gosport, Hampshire, UK: Institute of Naval Medicine, 2010.
- Fallowfield JL, Delves SK, Copley R. *Surgeon general's armed forces feeding project operational feeding in military personnel: Final Report. INM Report No. 2010.036*. Gosport, Hampshire, UK: Institute of Naval Medicine, 2010.
- Verrall NG. *Operational analysis at HQ joint force support (Afghanistan) on Op HERRICK 14/15: Post-Operational Report. DSTL/CR60465*, 2012.
- Ministry of Defence. *The future character of conflict*. Shrivenham, Oxon: UK DCDC, 2012.