

Prevalence of psychological trauma in operationally deployed Navy personnel: a baseline surveillance report

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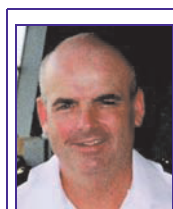
POST-TRAUMATIC STRESS DISORDER (PTSD) is characterised by a person being exposed to traumatic incidents with a strong emotional reaction, with a significant disturbance in functioning persisting for more than 1 month.¹ Early detection of PTSD is essential, as the pathology proceeds from an acute to a chronic condition,² and early therapy is more appropriate.^{3,4}

Military personnel form an “at-risk” group for trauma exposure,⁵⁻⁷ and the 2000 Health Status Report of the Defence Health Service (DHS)⁸ considered that mental health was a significant issue for the Australian Defence Force. Mental health monitoring and surveillance is considered by the Commonwealth Department of Health and Ageing to be a key aspect of a conceptual frame for the promotion, prevention and early intervention for mental health.⁹

In 2001, the Fleet Health Support Unit (FHSU) of Maritime Headquarters began briefing and screening Royal Australian Navy personnel deploying to the Middle East Area of Operations (MEAO). In its infancy, the program involved personnel being provided a mental health brief and mental health screening at the commencement of, and upon return from, operational deployments. This program was initially adapted from a process used by the Australian Army. The DHS standardised the process across the ADF,¹⁰ removing pre-deployment screening.

The results of individual questionnaires from screening were recorded and stored on a FHSU database. This database provided an opportunity for review and surveillance of mental health for individuals, ship cohorts, deployments and subgroups within the RAN. This report establishes surveillance baselines for psychological trauma-related symptoms in personnel deploying to the MEAO.

For this report, five questions were addressed:



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Abstract

- ◆ **Objective:** To identify the prevalence of psychological trauma symptoms among operationally deployed Royal Australian Navy personnel, identify intra-group differences, and to compare with other military groups.
- ◆ **Design and methods:** Post-traumatic Check List — Civilian version (PCL-C) results from Navy screening of 1739 naval personnel from 10 ship-cohorts between 2001 and 2005 were analysed to obtain prevalences of “caseness” (PCL-C \geq 50) for the total sample and by sex and rank group. Pre- and post-deployment differences are also reported for a subgroup of 460 personnel.
- ◆ **Results:** The prevalence rate for trauma caseness was 1.4%. For women, the rate was 2.5%, compared with 1.2% for men. There was no difference in prevalence rate by naval rank. Correction for pre-deployment cases gave a rate of 1.2%, and correction for sex distribution gave a rate of 1.8%. Combining both corrections gave a rate of 1.6%.
- ◆ **Conclusions:** The prevalence of trauma symptoms in this study group was in line with general community prevalence rates and was lower than expected for at-risk groups. This study establishes normative data for the PCL-C and background rates of trauma for operationally deployed RAN personnel.

ADF Health 2005; 6: 81-84

- What is the prevalence of significant psychological trauma symptoms among RAN personnel returning from operational deployment?
- What normative data for RAN personnel can be derived from the analysis?
- What differences in prevalence are there between subgroups within the population?
- How does the post-deployment prevalence of significant psychological trauma symptoms compare with pre-deployment?
- How does the prevalence of psychological trauma symptoms among RAN personnel compare with other military groups returning from deployment?

Methods

Data were recovered from a database of psychological screening records for personnel deployed to the MEAO between 2001 and 2005. Complete Post-traumatic stress disorder Checklist — Civilian version (PCL-C) results for

RAN personnel (with identifying information removed) were incorporated into a single database for analysis.

The PCL-C is a 17-item, self-report checklist based on key diagnostic criteria for PTSD.¹ Participants indicate, on a five-point scale, the experience of symptoms, giving an overall score in the range 17–85. There are three versions of the PCL, but all are very similar (with only slight wording differences in the questions) and the PCL-C is commonly used to screen for trauma. The PCL-C has good sensitivity and specificity, is positively correlated with other measures of PTSD, and has excellent test–retest reliability.^{11,12} A score of ≥ 50 on the PCL-C has been endorsed with an Australian military sample^{13–16} and in assessing other Persian Gulf veterans¹⁷ to indicate “caseness” for trauma.

Responses to the PCL-C were significantly skewed because of the nature of the questionnaire and the non-clinical population. Assumptions of normality of the distribution of PCL-C scores were not met (confirmed with a Lilliefors statistic), and non-parametric statistics using SPSS¹⁸ were used.

Approval for this study was provided by the Fleet Medical Officer as a means of monitoring the mental health of deployed Navy personnel.

Results

Between 2001 and 2005, 1739 people from 10 ship-cohorts were deployed to the MEAO. The mean size of individual ship-cohorts was 173.9 (range, 142–215). Men comprised 83.9% (range, 81.7%–91.0%) and women 16.1% (range, 9.0%–18.3%), and rank distribution was 68.4% (range, 64.1%–71.5%) junior sailors, 18.2% (range, 14.0%–21.8%) senior sailors, and 13.5% (range, 11.0%–15.4%) officers. This sex and rank-group distribution is representative of deployed or sea-going Navy personnel. Ship-cohorts included three Anzac class frigates, five Adelaide class frigates, and two Kanimbla class amphibious transports.

Within the data, the same person may be recorded more than once if they deployed on different ship-cohorts. For the purposes of this study, such personnel are considered different cases. Although age was not specifically recorded, the usual age range of ADF personnel (17–55 years) would apply to this population.

Actual data

The prevalence of trauma (PCL-C score ≥ 50) in RAN personnel returning from the MEAO per ship-cohort ranged from 0 to 5 cases (0–3.0%), with a total of 24 personnel (1.4%) (Box 1). The prevalence rate for women (2.5%) was twice that for men (1.2%). The overall mean PCL-C score was 23.4. There was no significant difference in PCL-C scores between rank groups, and the mean scores for all rank groups were well below the threshold for caseness.

For a subgroup ($n = 460$ from four ship-cohorts), psychological screening had been undertaken both before and after deployment. Six personnel (1.3%; 4 men, 2 women) changed from non-cases before deployment to cases after deployment; while four members (0.9%; all men) moved from cases before deployment to non-cases after deployment (Box 2). One member (0.2%; male) was classed as a case at both pre- and post-deployment screening.

Box 3 includes Spearman’s rank-order¹⁸ correlations of pre- and post-deployment caseness and PCL-C scores, indicating that pre- and post-deployment cases are positively associated at a low level, and pre- and post-deployment PCL-C scores are positively associated at a high level.

For 313 personnel (68.0%), there was no change in PCL-C scores from pre- to post-deployment. Forty-one personnel (8.9%) had lower scores after deployment than before deployment, and 106 (23.0%) had higher scores after deployment than before deployment. The magnitude of this change was an average of 0.87 (SD, 5.91), with variation in PCL-C scores over the course of deployment of three or fewer points for 397 personnel (86.3%). Women displayed significantly greater variation between pre- and post-deployment PCL-C scores than men (Mann–Whitney $z = -2.28$, $P < 0.05$, 2-tailed). There was no significant difference in variation between pre- and post-deployment PCL-C scores by naval rank (Kruskal–Wallis $\chi^2 = 1.184$, $df = 2$, $P > 0.05$).

Adjusted data

The prevalence of identified psychological trauma symptoms at the completion of deployment reflects both cases that developed during the deployment and cases (one person in this study) that existed before deployment. Pre-existing cases may inflate the actual prevalence rate attributable to the deploy-

I: PCL-C scores and “caseness” (PCL-C score ≥ 50) for Royal Australian Navy personnel returning from operational deployment in the Middle East, 2001–2005

	Junior sailor				Senior sailor				Officer				Total			
	PCL-C scores		Caseness		PCL-C scores		Caseness		PCL-C scores		Caseness		PCL-C scores		Caseness	
	N	Mean (SD)	n (%)		N	Mean (SD)	n (%)		N	Mean (SD)	n (%)		N	Mean (SD)	n (%)	
Men	959	23.4 (7.4)	12 (1.3%)		303	22.6 (6.4)	3 (1.0%)		197	23.4 (7.3)	2 (1.0%)		1459	23.2 (7.2)	17 (1.2%)	
Women	230	25.1 (8.8)	7 (3.0%)		13	22.5 (5.2)	0		37	21.7 (5.7)	0		280	24.5 (8.4)	7 (2.5%)	
Total	1189	23.7 (7.7)	19 (1.6%)		316	22.6 (6.4)	3 (0.9%)		234	23.1 (7.1)	2 (0.9%)		1739	23.4 (7.4)	24 (1.4%)	

ment. To estimate the prevalence of trauma attributable only to the deployment, personnel classified as cases at both pre- and post-deployment screening should be removed. With this correction (removal of one in seven or 14.3% of cases), the prevalence rate of cases (excluding pre-existing cases) from the larger normative cohort ($n = 1739$) of 24 (1.4%) would be reduced to 21 (1.2%).

With an unequal sex distribution (83.9% male) in the study group, comparability between this sample and general population samples (about 50% male) may be limited. To approximate the general population, the prevalence data from this study were converted using the formula:

$$\text{Estimated number of cases} = \frac{50}{\text{actual percentage distribution}} \times \text{actual number of cases}$$

This formula was applied to both sex subgroups using an estimated sex-equal sample size of 870 (total sample pool divided by 2). If this study group had been sex-equal (with 870 per sex group), 10 men (1.1% of men) and 22 women (2.5% of women) would have exceeded the PCL-C threshold. The overall prevalence rate of indicated PTSD in an estimated sex-neutral sample would be 32 cases (1.8% of the total sample).

Correcting both for sex distribution and for pre-existing caseness gives a prevalence of 27 cases (1.6%) for the total sample.

Discussion

The study group (1739 personnel from 10 ship-cohorts) was relatively consistent across ship-cohorts with regard to size, sex, and rank-group distribution. As such, prevalence rates and PCL-C scores can be considered normative data for RAN personnel operationally deployed to the MEAO.

Women were identified as cases at about twice the frequency of men. Although the difference between male and female PCL-C scores was significant, the mean PCL-C scores for both sex subgroups were well below the threshold for caseness. This suggests the statistical difference has little clinical meaning.

Based on the prevalence rate adjusted to exclude pre-existing cases, it could be expected that, for Anzac class and Adelaide class frigates with usual crews of 175 and 185, two cases of indicated psychological trauma at the end of deployment could be considered typical. For Kanimbla class transports with a usual crew of 215, two to three cases at the end of deployment could be considered typical.

Box 4 summarises the prevalence of psychological trauma symptoms in other studies of military personnel that used the PCL. RAN personnel in our sample reported lower prevalence rates for trauma than ADF forces from the 1991 Gulf War¹⁴ (data collected 10 years post-war). Further, the prevalence rate was lower than for US Army and Marine Corps personnel returning from operational deployment in Afghanistan and Iraq,¹⁷ and about the same as ADF tri-Service forces returning from East Timor.¹⁵

The actual and sex-adjusted prevalence rates of indicated PTSD in the sample are in the low end of the general

2: Pre- and post-deployment “caseness” (PCL-C \geq 50)

	Post non-caseness	Post caseness	Post total
Pre Non-caseness	449 (97.6%)	6 (1.3%)	445 (98.9%)
Pre Caseness	4 (0.9%)	1 (0.2%)	5 (1.1%)
Pre Total	453 (98.5%)	7 (1.5%)	460 (100%)

3: Pre- and post-deployment PCL-C scores

	Pre-deployment	Post-deployment
Mean (SD) male PCL-C (n = 392)	21.3 (6.7)	21.8 (7.1)
Mean (SD) female PCL-C (n = 68)	20.0 (4.4)	22.6 (8.0)
Mean (SD) total PCL-C (n = 460)	21.1 (6.5)	21.9 (7.3)
Number (%) with caseness	5 (1.1%)	7 (1.5%)
Correlation: caseness		+ 0.16
Correlation: PCL-C scores		+ 0.72

4: Prevalence rates of psychological trauma (PCL \geq 50) with comparison groups

2001–2005 Gulf War Royal Australian Navy (this study)	1.4%
1991 Gulf War Royal Australian Navy ¹⁴	7.5%
1991 Gulf War Australian Regular Army ¹⁴	15.1%
1991 Gulf War Royal Australian Air Force ¹⁴	6.1%
2002 ADF East Timor ¹⁵	1.5%
US Army returning from Afghanistan ¹⁷	6.2%
US Army returning from Iraq ¹⁷	12.9%
US Marine corps returning from Iraq ¹⁷	12.2%

community range (1%–14%),¹ and consistent with the general US population rate.^{19,20} Both the actual and adjusted prevalence rates of indicated PTSD for the study group were considerably lower than for at-risk groups (3%–58%).¹ Thus, the prevalence could be classed as low for operationally deployed military personnel (who would usually be considered at risk).

Our study did not include the entire dataset of RAN personnel deployed to the MEAO between 2001 and 2005 (data are predominantly from 2001–2002). Furthermore, some groups within the RAN (such as clearance diving teams and submariners) could constitute unique subgroups. Nevertheless,

this study provides a generally representative sample of three major surface ship types and a typical distribution of rank and sex in major fleet units operationally deployed in the MEAO during 2001–2005.

The PCL-C is a screening instrument and as such does not assess all aspects of PTSD. Therefore, caseness and indication of trauma does not constitute a diagnosis of PTSD — but rather, indicates the characteristic trauma symptoms of PTSD (criteria B, C and D of the diagnostic criteria for PTSD).¹ Further, the use of the PCL-C in this study does not consider possible delayed-onset PTSD, which, while rare, is a recognised variation of the disorder.²¹

The PCL-C was one of two structured questionnaires provided for each screening. However, although the PCL-C was used consistently for all personnel included in this project, the other screening questionnaire (used to indicate general psychological distress) was varied between ship-cohorts. Using only the PCL-C for this analysis allowed for the largest possible population sample.

It is beyond the scope of this study to explain the prevalence of psychological trauma symptoms or why it compares as it does to other military groups. Although different rates of exposure to trauma for the study group and comparison groups would be the most obvious speculation, other factors include differences in working conditions, group cohesion, leadership, training, general mental health, esprit de corps, and individual factors.

An obvious area of further research is to examine those who displayed the greatest change in PCL-C scores from pre- to post-deployment. Six members of the pre- and post-deployment subgroup developed caseness during deployment, and four remitted from caseness. Although the numbers of each are very small (1.3% and 0.9%, respectively), they represent a clinically interesting subgroup for further study — those whose psychological trauma presentations appear to be affected by deployment, in both positive and negative ways.

Conclusion

This study provides normative data on psychological trauma caseness for RAN personnel from three classes of surface ship. The prevalence of trauma caseness in this study group (using both uncorrected and corrected prevalence rates) is at the low end of community and at-risk groups, and is considerably lower than trauma prevalence identified among ADF personnel 10 years after their return from the 1991 Gulf War.

Acknowledgements

Pre- and post-deployment psychological screening was initiated in the Royal Australian Navy in 2001 by the Fleet Medical Officer and Deputy Fleet Medical Officers (Captain M Loxton and Commander R Walker) and first undertaken by Lieutenant Commander S Latimer. Personnel principally involved in providing these screens from which data was gathered were Lieutenant Commander S Latimer, Lieutenant Commander M Woodruff, Lieutenant Commander G Waghorn, Lieutenant G Currie, Lieutenant A Gordon, Lieutenant B Sheridan,

Lieutenant P Sneesby, Lieutenant F Van Damme, and Lieutenant K Young and Lieutenant S Rayner. Many thanks go to Mrs N Steele for her support and diligence in reviewing this article, and to Commander Latimer for his coaching with statistical analysis.

Competing interests

None identified.

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(Received 7 Jun 2005, accepted 20 Jul 2005)

