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The *Combat & Operational Stress Research Quarterly* is a compilation of recent research on combat and operational stress, including relevant findings on the etiology, course and treatment of Posttraumatic Stress Disorder (PTSD). The intent of this publication is to facilitate translational research by providing busy clinicians with up-to-date findings, with the potential to guide and inform evidence-based treatment.

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34960 Bob Wilson Dr., Suite 400
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Editorial Members:

Editor/Writer:
Kimberly Schmitz, MS

Writers:
Stephanie Raducha, BA
Amela Ahmetovic, BA

Content Assistance:
Jennifer Webb-Murphy, PhD

Copy Editor:
Margery Farnsworth, BA

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COMBAT & OPERATIONAL STRESS RESEARCH QUARTERLY

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STRESS CONTROL



Unit cohesion may buffer the effects of combat exposure on the mental health of deployed Marines

Key Findings: Greater combat exposure predicted higher posttraumatic stress, depression and anger, while greater unit cohesion predicted lower symptoms for each of these conditions among Marines deployed to Iraq. In addition, unit cohesion moderated the relationship between combat exposure and posttraumatic stress and depression.

Study type: Cross-sectional study with self-report assessments

Sample: 330 male members of a U.S. Marine infantry battalion returning from a deployment to Iraq

Implications: Unit cohesion may be an important buffer of the effects of combat exposure on the mental health of combat-deployed Marines. Efforts to improve unit cohesion may aid in preventing immediate and possibly long-term adverse mental health outcomes in combat-deployed service members.

Armistead-Jehle, P., Johnston, S.L., Wade, N.G. & Ecklund, C.J. (2011). Posttraumatic stress in U.S. Marines: The role of unit cohesion and combat exposure. *Journal of Counseling & Development, 89* (1), 81-88.

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Subthreshold PTSD associated with substantial functional impairment

Key Findings: At initial assessment post-disaster, 8.2% of World Trade Center disaster recovery workers met criteria for full PTSD and 9.7% met criteria for subthreshold PTSD. Those with full PTSD exhibited a 40% greater symptom severity and 30% greater functional impairment compared to the subthreshold group, but the subthreshold group had substantial functional impairment that was four times greater than those without PTSD. Two years after initial assessment, 24.5% of the initial sample with subthreshold PTSD continued to meet criteria for subthreshold or full PTSD.

Study type: Longitudinal study with clinical and self-report assessments

Sample: 3,360 World Trade Center disaster recovery workers

Implications: The findings emphasize the clinical relevance of subthreshold PTSD: Although symptoms are not as severe as full PTSD, the associated functional impairment can be significant and enduring. Larger numbers of individuals have functional impairment following a trauma than are assumed by considering the rates of full PTSD, and efforts should be made to include those with subthreshold PTSD in research and treatment opportunities.

Cukor, J., Wyka, K., Jayasinghe, N. & Difede, J. (2010). The nature and course of subthreshold PTSD. *Journal of Anxiety Disorders*, 24 (8), 918-23.

Pre-existing mental health conditions common among deployed treatment-seeking service members

Key Findings: Twenty-nine percent of military personnel receiving mental health services while deployed to Iraq had a previous psychiatric diagnosis in their military medical records prior to deployment. For those patients with a previous diagnosis, the most common disorder to be carried over in deployment was attention-deficit hyperactivity disorder (ADHD; 57%), followed by anxiety disorders (44%) – particularly PTSD (55%) – mood disorders (38%) and adjustment disorders (32%).

Study type: Retrospective record review

Sample: 1,078 U.S. military personnel who received mental health services while deployed to Iraq

Implications: A considerable proportion of patients experiencing mental health problems in a combat zone

had pre-existing conditions. Given that over half of pre-deployment diagnoses were received in the nine months prior to the in-theater mental health encounter, further research may be warranted to determine whether a minimum time should be established between receipt of a mental health diagnosis and eligibility for deployment to a combat zone.

Larson, G.E., Hammer, P.S., Conway, T.L., Schmied, E.A., Galarneau, M.R., Konoske, P., et al. (2011). Predeployment and in-theater diagnoses of American military personnel serving in Iraq. *Psychiatric Services*, 62 (1), 15-21.

PTSD is a stronger predictor of postconcussive symptoms than mTBI

Key Findings: Concussion/mild TBI (mTBI) was reported by 9.2% of soldiers in Iraq one month before returning home, but one year later, 22% of this sample reported sustaining mTBI during that deployment. Postconcussive symptoms were commonly reported by individuals with or without histories of mTBI or PTSD. After accounting for PTSD symptoms, mTBI without PTSD at the first assessment was not associated with postconcussive symptoms, depression, problematic drinking, somatic complaints, social adjustment or quality of life at the second assessment. Report of PTSD symptoms at the first assessment more strongly predicted postconcussive symptoms and negative psychosocial outcomes than did mTBI history.

Study type: Longitudinal study with self-report assessments

Sample: 953 U.S. National Guard soldiers deployed to Iraq

Implications: The two-fold increase in reports of deployment-related mTBI could be due to recall bias, survey reliability or different contexts of assessment (including fear of health concerns delaying return home) and should be investigated further. Similar to previous studies, findings from this study suggest that a history of deployment-related mTBI does not result in significant postdeployment health effects that are independent from PTSD.

Polusny, M.A., Kehle, S.M., Nelson, N.W., Erbes, C.R., Arbisi, P.A. & Thuras, P. (2011). Longitudinal effects of mild traumatic brain injury and posttraumatic stress disorder comorbidity on postdeployment outcomes in National Guard soldiers deployed to Iraq. *Archives of General Psychiatry*, 68 (1), 79-89.

Factors predicting deployment-related PTSD among National Guard soldiers

Key Findings: Among National Guard soldiers without PTSD symptoms pre-deployment, 14% reported post-deployment new-onset probable PTSD (as measured by the PTSD Checklist-Military). Reporting more stressors prior to or after deployment and feeling less prepared for deployment predicted new-onset PTSD, as did exposure to combat and combat's aftermath. Post-deployment social support was a protective factor against developing PTSD.

Study type: Longitudinal cohort study with self-report assessments

Sample: 552 Army National Guard troops previously deployed to Iraq

Implications: Although combat exposure during deployment may be unavoidable, this study highlights several factors that may be addressed in helping to prevent new-onset PTSD after deployment.

Polusny, M.A., Erbes, C.R., Murdoch, M., Arbisi, P.A., Thuras, P. & Rath, M.B. (2011). Prospective risk factors for new-onset post-traumatic stress disorder in National Guard soldiers deployed to Iraq. *Psychological Medicine*, 41 (4), 687-98.

Virtual reality exposure therapy may be an effective treatment for soldiers with post-deployment PTSD

Key Findings: Virtual reality exposure therapy significantly decreased PTSD symptoms among treatment-seeking active-duty soldiers who had previously deployed to Iraq or Afghanistan. Forty-five percent of those with probable PTSD prior to treatment (as measured by the PTSD Checklist-Military) did not meet criteria for probable PTSD post-treatment.

Study type: Treatment evaluation study with self-report assessments

Sample: 24 active-duty soldiers seeking mental health treatment following a deployment to Iraq or Afghanistan

Implications: These findings suggest that virtual reality exposure therapy may be an effective treatment modality for active-duty soldiers returning from OEF/OIF with PTSD, although larger, controlled studies are needed to validate the hypothesis.

Reger, G.M., Holloway, K.M., Candy, C., Rothbaum, B.O., Difede, J., Rizzo, A.A., et al. (2011). Effectiveness of virtual reality exposure therapy for active duty soldiers in a military mental health clinic. *Journal of Traumatic Stress*, 24 (1), 93-96.

Characteristics of OEF/OIF veterans reporting suicidal ideation

Key Findings: Twenty-two percent of treatment-seeking OEF/OIF veterans self-reported contemplating suicide in the two weeks prior to the assessment. Those contemplating suicide were older, more likely to screen positive for depression and PTSD and more likely to report deployment-related pain. They also showed more worry, self-punishment and avoidance and less psychological resilience and social support. Additional analyses revealed that PTSD and depression diminished the protective effect of social support on suicidal ideation.

Study type: Cross-sectional study with self-report assessments

Sample: 167 OEF/OIF veterans seeking behavioral or primary care services with Department of Veterans Affairs (VA) clinics

Implications: Suicidal ideation among treatment-seeking OEF/OIF veterans may be quite common, and interventions to reduce risk factors identified in the study should be implemented to decrease suicidality in this population.

Pietrzak, R.H., Russo, A.R., Ling, Q. & Southwick, S.M. (in press). Suicidal ideation in treatment-seeking veterans of Operations Enduring Freedom and Iraqi Freedom: The role of coping strategies, resilience, and social support. *Journal of Psychiatric Research*.

REVIEWS TO PERUSE

Vogt, D. (2011). **Mental health-related beliefs as a barrier to service use for military personnel and veterans: a review.** *Psychiatric Services*, 62 (2), 135-42.

Bruner, V.E. & Woll, P. (2011). **The battle within: understanding the physiology of war-zone stress exposure.** *Social Work in Health Care*, 50 (1), 19-33.

Bryant, R.A. (2011). **Acute stress disorder as a predictor of posttraumatic stress disorder: a systematic review.** *Journal of Clinical Psychiatry*, 72 (2), 233-9.



Biofeedback not effective in reducing PTSD or depression symptoms

Key Findings: The addition of heart rate variability (HRV) biofeedback to an intensive outpatient trauma recovery treatment program did not reduce PTSD or depression scores for active-duty personnel who had previously deployed to a combat zone.

Study type: Exploratory pilot study of an adjunct therapy

Sample: 39 active-duty service members (22 study subjects and 17 control subjects) enrolled in a trauma recovery treatment program

Implications: Further research, including larger randomized controlled trials with sham biofeedback units, should be conducted to further evaluate efficacy of HRV biofeedback as an adjunct therapy for PTSD.

Lande, R.G., Williams, L.B., Francis, J.L., Gragnani, C. & Morin, M.L. (2010). Efficacy of biofeedback for post-traumatic stress disorder. *Complementary Therapies in Medicine*, 18 (6), 256-259.

Sleep quality worse during or post-deployment compared to pre-deployment

Key Findings: Service members who were currently deployed or had returned from a deployment had significantly shorter adjusted sleep duration and increased adjusted odds of reporting trouble sleeping compared to those who had not deployed. However, further analyses revealed that the effect of deployment status on sleep was reduced or eliminated once mental health symptoms and combat exposures were taken into consideration.

Study type: Longitudinal cohort study with self-report assessments

Sample: 41,225 Millennium Cohort members (U.S. service members) who had never deployed, were on deployment, or had previously deployed at the time of the follow-up assessment

Implications: The finding that deployment status is associated with poorer sleep and that mental health symptoms and combat exposure may mediate this relationship suggests a need for further research and interventions for the potential physical and mental health effects of deployment-related sleep problems.

Seelig, A.D., Jacobson, I.G., Smith, B., Hooper, T.I., Boyko, E.J., Gackstetter, G.D., et al. (2010). Sleep patterns before, during, and after deployment to Iraq and Afghanistan. *Sleep*, 33 (12), 1615-22.

The relationship of TBI, PTSD and self-reported health and cognitive impairments

Key Findings: Injury patients with severe and moderate traumatic brain injury (TBI), but not mild TBI, showed a diminished risk of PTSD symptoms relative to patients without TBI. Patients with PTSD, regardless of TBI severity, showed an increased risk of health and cognitive impairments when compared with patients without PTSD.

Study type: Prospective cohort study

Sample: 3,047 survivors of multiple traumatic injuries

Implications: Mild TBI was not associated with PTSD symptoms, while more severe TBI was associated with decreased PTSD symptoms compared to injured patients without TBI. In addition, PTSD seems to be a more important factor than TBI severity in determining impairments in health and cognitive function. Interventions for injury patients with the full spectrum of TBI severity should integrate PTSD screening and treatment.

Zatzick, D.F., Rivara, F.P., Jurkovich, G.J., Hoge, C.W., Wang, J., Fan, M.Y., et al. (2010). Multisite investigation of traumatic brain injuries, posttraumatic stress disorder, and self-reported health and cognitive impairments. *Archives of General Psychiatry*, 67 (12), 1291-1300.

Mental health treatment retention in OEF/OIF veterans compared to Vietnam veterans

Key Findings: Initial analyses suggested that OEF/OIF veterans were more likely than Vietnam-era veterans to discontinue psychiatric treatment for PTSD at the VA within one year. However, after controlling for demographics and co-morbid diagnoses, OEF/OIF veterans were actually less likely to discontinue treatment than their Vietnam-era counterparts. In addition, OEF/OIF veterans had significantly more visits associated with PTSD treatment than Vietnam-era veterans after controlling for confounding factors.

Study type: Retrospective review of Department of Veterans Affairs and Department of Defense administrative data

Sample: 204,184 veterans who were newly diagnosed with PTSD

Implications: Although initial analyses appeared to show that OEF/OIF veterans discontinued PTSD treatment sooner and had fewer PTSD-related mental health visits than Vietnam-era veterans, adjusted

analyses demonstrated that these results were mainly due to younger age and co-morbid conditions and not the particular war in which they served. Interventions should be designed to target barriers to care that may be involved in veterans discontinuing mental health treatment.

Harpaz-Rotem, I. & Rosenheck, R.A. (2011). Serving those who served: Retention of newly returning veterans from Iraq and Afghanistan in mental health treatment. *Psychiatric Services*, 62 (1), 22-27.

Military sexual harassment predicts PTSD symptoms more strongly than combat exposure among female service members post-deployment

Key Findings: More than half of a sample of women returning from a deployment to Iraq reported deployment-related sexual harassment and approximately 75% reported combat exposure. Eleven percent screened positive for probable PTSD (using the Primary Care PTSD Screen) and 9% to 14% endorsed depressive symptoms (measured by a two-item version of the Center for Epidemiological Studies–Depression scale). Analyses revealed that sexual harassment, but not combat exposure, was a unique significant predictor of post-deployment PTSD symptoms.

Study type: Cross-sectional study with self-report assessments

Sample: 54 active-duty women returning from a deployment to Iraq

Implications: Consistent with previous research, sexual harassment is relatively common in the military, with more than half of a sample of female OIF veterans providing endorsement. The finding that military sexual harassment may be more strongly related to post-deployment PTSD symptoms than combat exposure has important implications for the prevention and treatment of PTSD in this population.

Dutra, L., Grubbs, K., Greene, C., Trego, L.L., McCartin, T.L., Kloezeman, K., et al. (2011). Women at war: Implications for mental health. *Journal of Trauma & Dissociation*, 12 (1), 25-37.

National Guard soldiers may have unique risk factors for post-deployment mental health problems

Key Findings: Financial hardship, job loss, lack of employer support and a negative effect of deployment

absence on co-workers were associated with depression and/or PTSD among National Guard soldiers at three and/or 12 months post-deployment.

Study type: Cross-sectional study with self-report assessments at two time points

Sample: 4,034 U.S. National Guard soldiers previously deployed to Iraq

Implications: National Guard soldiers may have unique concerns compared with active-duty soldiers that affect their well-being. Such factors as employer support, job loss and financial difficulties post-deployment can contribute to the development of mental health problems among National Guard soldiers, and a better understanding of these and other contributing factors is necessary to prevent further mental health problems in this population.

Riviere, L.A., Kendall-Robbins, A., McGurk, D., Castro, C.A. & Hoge, C.W. (2011). Coming home may hurt: risk factors for mental ill health in US reservists after deployment in Iraq. *British Journal of Psychiatry*, 198, 136-42.

Preventative effects of pre-deployment mental health screenings

Key Findings: Brigades that were screened for mental health problems pre-deployment had significantly lower rates of suicidal ideation, combat stress, psychiatric disorders, occupational impairment and air evacuation for behavioral health reasons while deployed than similar brigades that were not screened pre-deployment. Screened soldiers who were found to have mental health problems pre-deployment were either not deployed or had in-theater care coordinated for them while deployed.

Study type: Evaluation of a screening program that consisted of a form designed to identify DoD-specified deployment-limiting criteria and evaluation by a mental health provider if indicated

Sample: 10,678 soldiers from three screened combat brigades and 10,353 soldiers from three unscreened brigades

Implications: Pre-deployment mental health screening may be beneficial in reducing rates of occupationally impairing mental health problems, medical evacuations and suicidal ideation during deployment. The screening process also provides a practical system for screening soldiers and coordinating care during deployment.

Warner, C.H., Appenzeller, G.N., Parker, J.R., Warner, C.M. & Hoge, C.W. (in press). Effectiveness of mental health screening and coordination of in-theater care prior to deployment to Iraq: A cohort study. *American Journal of Psychiatry*.

PTSD-unique fear symptoms should be emphasized in new diagnostic criteria

Key Findings: Analysis of data from injury survivors revealed the PTSD-unique symptom clusters of re-experiencing, hyper-arousal and avoidance were significantly more closely related to the fear/phobic disorders, while shared PTSD symptoms of dysphoria were significantly more closely related to the Anxious-Misery disorders of major depressive disorder and generalized anxiety disorder.

Study type: Longitudinal study with clinical assessments

Sample: 714 injury survivors receiving specialized treatment

Implications: The results suggest there are two distinct dimensions of psychopathology underlying PTSD, and a revision may be needed in the definition and conceptualization of PTSD for the DSM-V to mandate endorsement of more of the PTSD-unique fear-related symptoms, which should improve specificity of diagnosis. Psychological interventions should be tailored to the most dominant symptoms for each patient to ensure the most effective treatment.

Forbes, D., Parslow, R., Creamer, M., O'Donnell, M., Bryant, R., McFarlane, A., et al. (2010). A longitudinal analysis of posttraumatic stress disorder symptoms and their relationship with Fear and Anxious-Misery disorders: implications for DSM-V. *Journal of Affective Disorders*, 127 (1-3), 147-152.

Cognitive-behavioral conjoint therapy may be an effective treatment for PTSD

Key Findings: Cognitive-behavioral conjoint therapy (CBCT), in which partners of PTSD patients are involved in the treatment, led to a significant decrease in overall PTSD symptoms among the patients from pre-treatment to post-treatment, with only one of the six PTSD patients remaining positive for PTSD at treatment completion. Patients also reported large improvements in depression and anger symptoms post-treatment. In addition, patients and their respective partners reported moderate to large improvements in relationship satisfaction post-treatment.

Study type: Treatment evaluation study with clinical and self-report assessments

Sample: Six couples where one partner has PTSD; patients have varying traumas, gender and sexual orientation

Implications: Although larger studies are needed, CBCT seems to be well tolerated and may be an

effective way to treat PTSD patients by incorporating their partners in the treatment. Partner involvement may serve as social support and may also help educate both partners about PTSD and relationship functioning.

Monson, C.M., Fredman, S.J., Adair, K.C., Stevens, S.P., Resick, P.A., Schnurr, P.P., et al. (2011). Cognitive-behavioral conjoint therapy for PTSD: Pilot results from a community sample. *Journal of Traumatic Stress*, 24 (1), 97-101.

Barriers to care among National Guard soldiers and significant others

Key Findings: Forty percent of National Guard soldiers and 34% of significant others met criteria for one or more mental health problems upon the soldiers' return from deployment. Of this subset, 53% sought help (50% soldiers, 61% significant others). Barriers to care ranked highest by soldiers were stigma associated with mental health care and concerns about career advancement, including mental health care appearing on military records. Barriers to care ranked highest by significant others were costs of mental health care, trouble with scheduling appointments, time off from work and not knowing where to get help.

Study type: Cross-sectional study with self-report assessments conducted within three months post-deployment

Sample: 332 previously deployed National Guard soldiers and 212 significant others

Implications: Given that only about half of National Guard soldiers and their significant others are getting help for their mental health problems, further efforts are necessary to minimize the barriers to care that prevent them from seeking treatment.

Gorman, L.A., Blow, A.J., Ames, B.D. & Reed, P.L. (2011). National Guard families after combat: Mental health, use of mental health services, and perceived treatment barriers. *Psychiatric Services*, 62 (1), 28-34.

Psychological resilience mediated by cognitive appraisals

Key Findings: Greater positive psychological capital (PsyCap), a construct of various traits involved in psychological resilience, was significantly associated with better physical and psychological health among soldiers deployed to Iraq. These associations were mediated by cognitive appraisals (how stressful events are viewed and interpreted). Furthermore, the

relationships between PsyCap and health symptoms, as well as the effect of cognitive appraisals, were stronger among soldiers with greater combat exposure.

Study type: Cross-sectional study with self-report assessments

Sample: 648 U.S. Army soldiers deployed to Iraq

Implications: PsyCap appears to play an important role in resilience to potentially traumatic events, and efforts to train service members to engage in behaviors typical of individuals with high PsyCap scores (such as optimism, hope and adaptability) may help individuals cope more effectively in the face of traumatic stress.

Schaubroeck, J.M., Riolli, L.T., Peng, A.C. & Spain, E.S. (2011). Resilience to traumatic exposure among soldiers deployed in combat. *Journal of Occupational Health Psychology, 16* (1), 18-37.

Integrated smoking cessation and PTSD treatment results in more smoking cessation among PTSD patients

Key Findings: Smokers with PTSD who received smoking cessation treatment integrated with mental health treatment were roughly twice as likely to stop smoking between three and 18 months after treatment initiation compared to smokers with PTSD who received only smoking cessation treatment. Both groups experienced an approximate 10% decrease in PTSD severity, and PTSD severity post-treatment did not differ between quitters and non-quitters.

Study type: Randomized controlled trial

Sample: 943 smokers with military-related PTSD

Implications: Integrating mental health care into smoking cessation treatment resulted in more PTSD patients quitting smoking compared to smoking cessation treatment alone, while both groups demonstrated similar small decreases in PTSD severity.

Contrary to previous reports, these findings suggest that smoking cessation is possible without any deterioration of psychiatric status.

McFall, M., Saxon, A.J., Malte, C.A., Chow, B., Bailey, S., Baker, D.G., et al. (2010). Integrating tobacco cessation into mental health care for posttraumatic stress disorder: a randomized controlled trial. *Journal of the American Medical Association, 304* (22), 2485-93.

Substance use disorders among OEF/OIF veterans using VA healthcare

Key Findings: More than 11% of OEF/OIF veterans who were first-time users of VA healthcare had substance use disorder diagnoses: 10% had alcohol use disorder diagnoses, 5% had drug use disorder diagnoses and 3% were diagnosed with both disorders. Being male, under age 25, unmarried or having greater combat exposure increased the risk of these diagnoses. Of those with substance use disorders, 55%-75% also had PTSD or depression diagnoses, and substance use disorders were 3 to 4.5 times more likely in those with PTSD and depression.

Study type: Retrospective review of Department of Veterans Affairs administrative data

Sample: 456,502 OEF/OIF veterans who were first-time users of VA healthcare

Implications: This study highlights the significance of substance use disorders in OEF/OIF veterans and the need for them to be treated in conjunction with co-morbid PTSD and depression.

Seal, K.H., Cohen, G., Waldrop, A., Cohen, B.E., Maguen, S. & Ren, L. (in press). Substance use disorders in Iraq and Afghanistan veterans in VA healthcare, 2001-2010: Implications for screening, diagnosis and treatment. *Drug and Alcohol Dependence*.

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The Navy and Marine Corps Combat & Operational Stress Control Conference 2011 will be held April 26-29, 2011, at the Town & Country Resort and Convention Center in San Diego.

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TEST YOUR KNOWLEDGE!

According to the summary "PTSD is a stronger predictor of postconcussive symptoms than mTBI" (pg. 2), after accounting for PTSD symptoms, mTBI without PTSD predicts which of the following:

- A. Postconcussive symptoms
- B. Somatic complaints
- C. Quality of life
- D. All of the above
- E. None of the above

Answer: E

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