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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 evidenced-based treatment.

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COMBAT & OPERATIONAL STRESS RESEARCH QUARTERLY

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Gender affects the relationship between combat exposure and psychological consequences following OEF/OIF deployments

Key Findings: Depression rates for male and female Soldiers were similar pre-deployment, but increased more among females compared to males after experiencing a combat deployment. Pre- and post-deployment PTSD rates did not differ significantly by gender. Gender affected the association between combat exposure and depressive and PTSD symptoms following combat deployment such that female personnel who reported higher levels of combat exposure were more likely to experience depression and PTSD symptoms compared to males with the same level of combat exposure.

Study type: Retrospective analysis of pre- and post- deployment self-report health assessments
Sample: 6,943 active duty Soldiers (6,427 males and 516 females) who had deployed in support of OEF/OIF

Implications: The findings suggest that combat exposure is a stronger predictor of post-deployment depression and PTSD for women compared to men. It is essential to consider the different psychological responses between male and female service members following combat deployments in order to develop the most appropriate and efficient treatments.

Luxton, D.D., Skopp, N.A. & Maguen, S. (in press). Gender differences in depression and PTSD symptoms following combat exposure. *Depression and Anxiety*.

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PTSD risk factors in Marines deployed to OEF/OIF

Key Findings: Several types of combat exposures are significant risk factors for post-deployment PTSD, including the threat of death, serious injury and witnessing injury or death. Experiencing violence before recruit training, a greater number of deployments and lower enlisted pay grade were also risk factors for PTSD, while having more close friends or relatives was protective against developing PTSD.

Study type: Longitudinal study with self-report assessments

Sample: 706 male Marines deployed in support of OEF/OIF

Implications: Previous exposure to violence, along with exposure to dangerous combat situations, may synergistically enhance the risk of developing PTSD in young Marines. Such risk factors should be assessed post-deployment in order to identify those at risk for developing PTSD.

Phillips, C.J., Leardmann, C.A., Gumbs, G.R. & Smith, B. (2010). Risk factors for posttraumatic stress disorder among deployed US male Marines. *BMC Psychiatry*, 10 (52).

PTSD and deployment-related stressors associated with antisocial behavior in combat veterans

Key Findings: Five factors were found to be associated with antisocial behavior in combat veterans: PTSD symptoms, deployment-related (non-combat) stressors, combat exposure, younger age and being divorced. Of these, PTSD symptoms were the factor most strongly associated with antisocial behavior.

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

Sample: 1,543 enlisted Marines who deployed to combat zones as part of OEF/OIF

Implications: Deployment-related stressors, which were related to antisocial behavior in this population, can be ameliorated in such ways as shortening deployments and improving communication with home during deployment. The association between PTSD symptoms and antisocial behavior is cause for concern due to increasing rates of PTSD in these veterans, and more research is needed to determine the best interventions for veterans with PTSD who display antisocial behavior.

Booth-Kewley, S., Larson, G.E., Highfill-McRoy, R.M., Garland, C.F. & Gaskin, T.A. (2010). Factors associated with antisocial behavior in combat veterans. *Aggressive Behavior*, 36 (5), 330-337.

Emotional numbing symptoms linked to alcohol misuse in OEF/OIF vets

Key Findings: Rates of alcohol misuse were higher among younger male OEF/OIF veterans in the Army or Marine Corps. In addition, veterans who screened positive for PTSD or depression were twice as likely to report alcohol misuse compared to veterans without these disorders. An examination of PTSD symptom clusters indicated emotional numbing symptoms were most strongly associated with alcohol misuse.

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

Sample: 287 OEF/OIF veterans presenting for VA healthcare

Implications: Veterans with PTSD and depression may be drinking alcohol to mitigate the symptoms of these disorders, i.e., self-medication. Also, the association between alcohol use and emotional numbing symptoms could indicate that veterans are using alcohol to improve mood and aid socialization. Young military service members may benefit from education on the relationships between mental health and alcohol use.

Jakupcak, M., Tull, M.T., McDermott, M.J., Kaysen, D., Hunt, S. & Simpson, T. (2010). PTSD symptom clusters in relationship to alcohol misuse among Iraq and Afghanistan war veterans seeking post-deployment VA health care. *Addictive Behaviors*, 35 (9), 840-843.

Sleep problems predict less PTSD remission

Key Findings: The majority of anxiety patients in this study (74%) reported experiencing sleep disturbance at the intake assessment, and those with PTSD or generalized anxiety disorder were more than twice as likely to have sleep problems compared to patients without the disorders. Sleep disturbance at intake predicted the course of PTSD, as PTSD patients with sleep disturbance were less likely to remit from PTSD in the 5 years after the intake assessment compared to those without sleep disturbance (34% vs. 56% in remission, respectively).

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

Sample: 533 primary care patients with anxiety disorders

Implications: The findings suggest that sleep disturbance can play a role in the prognosis of PTSD, and it may be important to specifically address sleep difficulties in interventions for PTSD.

Marcks, B.A., Weisberg, R.B., Edelen, M.O. & Keller, M.B. (2010). The relationship between sleep disturbance and the course of anxiety disorders in primary care patients. *Psychiatry Research*, 178 (3), 487-92.

Sleep problems can contribute to combat stress-related PTSD or depression

Key Findings: Insomnia symptoms were shown to reduce the correlation between combat stressors and non-insomnia depression symptoms when included in a model; the same correlation reduction was true for nightmare symptoms when included in a model with combat stressors and other PTSD symptoms. These findings implicate sleep symptoms as a partial mediator between combat stressors and non-sleep-related mental health symptoms.

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

Sample: 576 Army veterans of the Iraq War

Implications: The findings support the theory that sleep symptoms may contribute to the development and/or maintenance of non-sleep-related PTSD or depression symptoms. Early treatment of sleep symptoms may help to reduce the detrimental effects of combat stress on mental health.

Picchioni, D., Cabrera, O.A., McGurk, D., Thomas, J.L., Castro, C.A., Balkin, T.J., et al. (2010). Sleep symptoms as a partial mediator between combat stressors and other mental health symptoms in Iraq War veterans. *Military Psychology, 22* (3), 340-55.

PTSD symptoms strongly related to post-concussive symptoms in mTBI patients

Key Findings: PTSD symptoms in veterans with only blast-related mild traumatic brain injury (mTBI) were slightly higher (marginally significant) than those in veterans with only non-blast-related mTBI. The two groups did not differ significantly in terms of post-concussive (PC) symptoms. However, PTSD symptoms were positively associated with PC symptoms and accounted for a substantial portion of variance in PC symptom reports.

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

Sample: 339 OEF/OIF veteran outpatients with symptoms of mTBI

Implications: Mechanism of mTBI injury does not appear to affect PC symptoms but may affect PTSD symptoms. PTSD symptoms are strongly associated with PC symptoms in combat veterans with a history of mTBI, and assessment and treatment of PTSD symptoms may be beneficial for the treatment of PC symptoms.

Lippa, S.M., Pastorek, N.J., Bengel, J.F. & Thornton, G.M. (in press). Postconcussive symptoms after blast and nonblast-related mild traumatic brain injuries in Afghanistan and Iraq War veterans. *Journal of the International Neuropsychological Society*.

Does prior assaultive violence trauma sensitize a person to PTSD?

Key Findings: Prior assaultive violence (or other types of trauma) not resulting in PTSD had no influence on the risk for PTSD following a subsequent trauma. However, prior trauma that did cause PTSD substantially increased the risk for PTSD following subsequent traumas.

Study type: Retrospective study with self-report and diagnostic assessments via telephone interview

Sample: 2,181 general population adult participants from the 1996 Detroit Area Survey of Trauma

Implications: The study contradicts previous findings that type of previous trauma can affect future risk for PTSD following subsequent trauma. Instead, prior development of PTSD seems to be a key risk factor for developing PTSD after a subsequent trauma.

Breslau, N. & Peterson, E.L. (2010). Assaultive violence and the risk of posttraumatic stress disorder following a subsequent trauma. *Behaviour Research and Therapy, 48* (10), 1063-1066.

REVIEWS TO PERUSE

Forbes, D., Creamer, M., Bisson, J.I., Cohen, J.A., Crow, B.E., Foa, E.B., et al. (2010). **A guide to guidelines for the treatment of PTSD and related conditions.** *Journal of Traumatic Stress, 23* (5), 537-52.

McDonald, S.D. & Calhoun, P.S. (2010). **The diagnostic accuracy of the PTSD checklist: a critical review.** *Clinical Psychology Review, 30* (8), 976-87.

Gerardi, M., Cukor, J., Difede, J., Rizzo, A., Rothbaum, B.O. (2010). **Virtual reality exposure therapy for post-traumatic stress disorder and other anxiety disorders.** *Current Psychiatry Reports, 12* (4), 298-305.



Intensive Cognitive Therapy for PTSD may be a promising alternative to traditional CBT

Key Findings: Intensive Cognitive Therapy for PTSD— involving 18 hours of therapy over five to seven days, one session a week later and up to three follow-up sessions— was found to reduce PTSD symptoms below the threshold for diagnosis in 85.7% of the patients at three months post-treatment. When compared to a study of traditional weekly Cognitive Behavior Therapy, intensive treatment study participants were found to have similar overall outcomes but demonstrated faster decreases in PTSD symptoms and greater reductions in depression.

Study type: Feasibility trial with clinical interview and self-report survey assessments

Sample: Fourteen adult patients recruited from referrals to anxiety disorder centers who met criteria for chronic PTSD

Implications: Intensive Cognitive Therapy for PTSD may be a feasible alternative to traditional weekly treatments. There were no disadvantages found compared to traditional Cognitive Behavioral Therapy, and advantages include more rapid symptom reduction, greater reductions in depression and a possible reduced chance of treatment non-completion. However, the preliminary trial had a very small sample size, and further evaluation of this treatment modality in randomized controlled trials is needed.

Ehlers, A., Clark, D.M., Hackmann, A., Grey, N., Liness, S., Wild, J., et al. (2010). Intensive cognitive therapy for PTSD: a feasibility study. *Behavioural and Cognitive Psychotherapy*, 38 (4), 383-398.

Dissociation and disclosure in group therapy for PTSD

Key Findings: Veterans with PTSD who attended an eight-week group therapy program reported a decrease in the frequency and severity of dissociation by the three-month follow-up. Participants who discussed their traumatic experience at great length during therapy sessions (categorized as high self-disclosers by group therapy facilitators) had higher levels of dissociation at baseline, program end and three-month follow-up compared to participants who rarely or never discussed their traumatic experience (categorized as low self-disclosers). However, the high self-disclosers showed a greater comparative reduction in dissociation from program end to three-month follow-up compared to the low self-disclosers. Overall, levels of anxiety were significantly lower at follow-up than at baseline regardless of disclosure.

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

Sample: 72 male military veterans with PTSD attending a group therapy treatment program (8 weeks of individual counseling and group therapy sessions, including group exposure therapy sessions)

Implications: PTSD therapy that encourages patients to disclose information about their trauma may be beneficial to reducing dissociation and anxiety symptoms. However, previous studies have found that therapies focusing on trauma may not result in better outcomes than therapies not focused on trauma, but more research is needed to confirm the findings.

Bowen, A., Shelley, M., Helmes, E. & Landman, M. (2010). Disclosure of traumatic experiences, dissociation, and anxiety in group therapy for posttraumatic stress. *Anxiety, Stress, & Coping*, 23 (4), 449-461.

PTSD increases risk of developing diabetes

Key Findings: Older age, larger BMI, non-Caucasian ethnicity, having separated from the military, and PTSD were significantly associated with an increased risk for new-onset diabetes among military service members in a multivariable model that included demographics, military service characteristics and mental health conditions. Other mental health conditions were not significantly related to incident diabetes in this model, although they were associated in unadjusted analyses.

Study type: Longitudinal study with self-report assessments

Sample: 44,754 military service members in the Millennium Cohort Study

Implications: PTSD symptoms at baseline, but not other mental health symptoms, were significantly associated with an increased risk of developing diabetes after controlling for demographics, other mental health conditions and military factors. Further research is needed to investigate the mechanism behind this association. Increases in the prevalence of PTSD among the military population could have an impact on rates of physical disorders, such as diabetes, in the coming years.

Boyko, E.J., Jacobson, I.G., Smith, B., Ryan, M.A., Hooper, T.I., Amoroso, P.J., et al. (2010). Risk of diabetes in U.S. military service members in relation to combat deployment and mental health. *Diabetes Care*, 33 (8), 1771-7.

Domestic abuse highly prevalent among OEF/OIF veterans with PTSD

Key Findings: Among a sample of male OEF/OIF veterans with PTSD, the proportion that recently perpetrated or sustained psychological and/or physical partner abuse ranged from 56% to 93%. Male OEF/OIF veterans with PTSD were 1.9 to 3.1 times more likely to show aggression toward their female partners and were 1.6 to 6 times more likely to experience aggression from a female partner compared to Vietnam veterans with PTSD or OEF/OIF veterans without PTSD. Also, correlations among reported perpetrated and sustained violence suggest that many male veterans may have been in mutually violent relationships.

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

Sample: 86 male veterans with or without PTSD: 27 OEF/OIF veterans with PTSD, 31 OEF/OIF veterans without PTSD and 28 Vietnam veterans with PTSD

Implications: OEF/OIF veterans with PTSD may have increased levels of domestic violence compared to the past generation of Vietnam veterans with PTSD and OEF/OIF veterans without PTSD, although further research with larger sample sizes is needed to confirm the hypothesis. Treatment providers for OEF/OIF veterans should be aware of the high prevalence of partner aggression in this population, especially that which could exacerbate a traumatic stress disorder.

Teten, A.L., Schumacher, J.A., Taft, C.T., Stanley, M.A., Kent, T.A., Bailey, S.D., et al. (2010). Intimate partner aggression perpetrated and sustained by male Afghanistan, Iraq, and Vietnam veterans with and without posttraumatic stress disorder. *Journal of Interpersonal Violence*, 25 (9), 1612-1630.

Deployment preparedness can affect perceived threat levels in combat

Key Findings: In an attempt to integrate known PTSD risk factors into a comprehensive model, it was found that combat exposure levels, post-battle experiences and perceived threat during deployment were all strongly correlated with PTSD symptom severity as well as each other. Perceptions of threat mediate the association of combat exposures with PTSD. In addition, a sense of preparedness for deployment moderated the association of perceived threat with combat exposures, such that troops reporting low preparedness perceived high levels of threat regardless of combat exposure, while more prepared troops perceived threat levels more in line with actual combat exposures.

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

Sample: 207 OEF/OIF era combat veterans

Implications: Greater preparedness for deployment may be indirectly helpful in reducing PTSD development by reducing perceptions of threat in service members who experience combat situations that are of a low threat level. However, preparedness seems to have no effect on perceptions of threat when troops are facing a highly dangerous combat experience.

Renshaw, K.D. (in press). An integrated model of risk and protective factors for post-deployment PTSD symptoms in OEF/OIF era combat veterans. *Journal of Affective Disorders*.

Characterization of traumatic brain injuries among OIF veterans

Key Findings: The vast majority of traumatic brain injuries (TBIs) in a sample of OIF veterans were mild in severity and a result of blast mechanisms, mainly improvised explosive devices (IEDs). Sustaining a TBI by gunshot and not using a helmet were associated with a higher severity of TBI. Injuries to other parts of the body were more likely as the severity of TBI increased. Blast injury mechanisms were also associated with injuries to the spine and back.

Study type: Review of clinical records from the combat theater

Sample: 2,074 U.S. service members who sustained brain injuries in Iraq

Implications: The results suggest there may be an injury-specific profile for combat-related TBI that differs by TBI severity. Further research on the effect of concurrent injuries on rehabilitation outcomes for TBI is warranted in order to improve TBI treatments.

MacGregor, A.J., Dougherty, A.L. & Galarnau, M.R. (in press). Injury-specific correlates of combat-related traumatic brain injury in Operation Iraqi Freedom. *Journal of Head Trauma and Rehabilitation*.

Trauma centrality predicts PTSD symptom severity in OEF/OIF vets

Key Findings: Trauma centrality, or how much an individual integrates a traumatic event into his or her identity, was a predictor of PTSD symptom severity in OEF/OIF combat veterans. Trauma centrality and PTSD symptoms were significantly correlated even when controlling for depression.

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

Sample: 46 OEF/OIF combat veterans with and without probable PTSD

Implications: The study replicates previous findings of a positive correlation between PTSD and trauma centrality and extends them to individuals exposed to combat stress. These findings conflict with the theory that PTSD represents an inability to integrate a traumatic memory into one's identity and self-narrative. Rather, placing a traumatic event at the center of one's identity seems to enhance the severity of PTSD symptoms.

Brown, A.D., Antonius, D., Kramer, M., Root, J.C. & Hirst, W. (2010). Trauma centrality and PTSD in veterans returning from Iraq and Afghanistan. *Journal of Traumatic Stress, 23* (4), 496-499.

Sleep disturbance predictors in OEF/OIF vets reporting trauma

Key Findings: Several health factors predicted sleep disturbances and nightmares in OEF/OIF veterans reporting a trauma after controlling for demographics and non-sleep PTSD symptoms. Head injury with a loss of consciousness increased the likelihood of severe nightmares, while alcohol abuse or dependence increased the likelihood of moderate nightmares. Greater non-sleep depression increased the likelihood of severe difficulties initiating and maintaining sleep.

Study type: Cross-sectional study with self-report and clinical interview assessments

Sample: 201 OEF/OIF combat veterans reporting a trauma (combat or non-combat related)

Implications: Although non-sleep PTSD symptoms are related to sleep disturbances, there are many other psychiatric and physical health factors that also can affect sleep among combat veterans who have experienced a trauma. In order to alleviate sleep problems after a trauma, a treatment plan that focuses on many of these health factors, not just PTSD symptoms, should be enacted.

Gellis, L.A., Gehrman, P.R., Mavandadi, S. & Oslin, D.W. (2010). Predictors of sleep disturbances in Operation Iraqi Freedom/Operation Enduring Freedom veterans reporting a trauma. *Military Medicine, 175* (8), 567-573.

Posttraumatic growth predicts PTSD treatment outcome

Key Findings: Posttraumatic growth, or positive psychological change after a trauma, predicted decreased PTSD symptoms (particularly emotional numbing) among patients in an exposure therapy program. In addition,

posttraumatic growth increased during exposure therapy and these increases were associated with decreases in PTSD symptoms. Pre-treatment posttraumatic growth (specifically, the Appreciation of Life factor) predicted better treatment outcome after controlling for pre-treatment PTSD.

Study type: Longitudinal study with pre- and post-treatment self-report and clinical interview assessments

Sample: 80 outpatients with PTSD undergoing a standardized Prolonged Exposure treatment program (8-12 sessions of 45 minutes each)

Implications: Posttraumatic growth may have an important role in treating PTSD. Some aspects of posttraumatic growth were found to change as a result of exposure therapy, while other aspects were predictive of treatment outcome. However, more research on the concept is needed to determine whether treatments should be designed to increase posttraumatic growth.

Hagenaars, M.A. & van Minnen, A. (2010). Posttraumatic growth in exposure therapy for PTSD. *Journal of Traumatic Stress, 23* (4), 504-508.

Multiple adverse childhood experiences predict post-deployment PTSD among male Marines

Key Findings: Male Marines who reported Adverse Childhood Experiences (ACE) in multiple categories (e.g., physical neglect, physical abuse, emotional neglect, emotional abuse, domestic violence, sexual abuse) were more likely to develop post-deployment PTSD than those who reported no ACEs. Physical neglect was the ACE that most strongly predicted post-deployment PTSD.

Study type: Retrospective review of pre-deployment Recruit Assessment Program survey data and post-deployment medical records

Sample: 8,391 male Marines who deployed in support of OEF/OIF

Implications: Male Marines who reported multiple types of ACE were at greater risk for post-deployment PTSD. PTSD prevention and early intervention programs could be targeted to this population to mediate the risk for post-deployment PTSD.

LeardMann, C.A., Smith, B.Z. & Ryan, M.A. (2010). Do adverse childhood experiences increase the risk of postdeployment posttraumatic stress disorder in US Marines? *BMC Public Health, 10*, 437.

PTSD increases suicide risk with or without co-morbid depression

Key Findings: Individuals with PTSD or major depressive disorder (MDD)—but not alcohol use disorder (AUD)—were at increased risk for suicidal ideation. Individuals with PTSD co-morbid with MDD or AUD were not more likely to endorse suicidality compared to individuals with PTSD alone. The emotional numbing cluster of PTSD symptoms and the cognitive-affective cluster of MDD symptoms were positively associated with suicidality.

Study type: Retrospective data review with self-report and clinical assessments

Sample: 393 OEF/OIF veterans who were part of the Mid-Atlantic Mental Illness Research, Education and Clinical Center Registry

Implications: These findings emphasize that individuals with PTSD are at increased risk for suicide, even if they do not have co-morbid MDD or AUD. Clinicians treating PTSD patients should regularly assess the patients for suicidality, just as is typically done for MDD patients, regardless of the presence or absence of co-occurring psychiatric problems.

Guerra, V.S.; Mid-Atlantic Mental Illness Research, Education and Clinical Center Workgroup, Calhoun, P.S. (in press). Examining the relation between posttraumatic stress disorder and suicidal ideation in an OEF/OIF veteran sample. *Journal of Anxiety Disorders*.

Mutual maintenance of pain and PTSD symptoms

Key Findings: PTSD arousal and re-experiencing symptoms one week after injury predicted pain at three months, and the same PTSD symptom clusters at three months predicted pain at 12 months. In addition, the relationship between acute pain (one week after injury) and pain at 12 months post-injury was influenced by PTSD arousal symptoms at three months post-injury. Pain symptoms at three months post-injury predicted having all three PTSD symptom clusters at 12 months.

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

Sample: 824 hospitalized injury patients

Implications: The findings provide support for the mutual maintenance between chronic pain and PTSD in injury patients. High levels of re-experiencing and arousal after a trauma are important in the development of chronic pain, and pain experienced months after injury is a significant predictor of sustained PTSD symptomatology. Early interventions that target both pain and PTSD are crucial in preventing the chronicity of both these conditions.

Liedl, A., O'Donnell, M., Creamer, M., Silove, D., McFarlane, A., Knaevelsrud, C., et al. (2010). Support for the mutual maintenance of pain and post-traumatic stress disorder symptoms. *Psychological Medicine*, 40 (7), 1215-23.

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TEST YOUR KNOWLEDGE!

According to the summary “Does prior assaultive violence trauma sensitize a person to PTSD?” (pg 3), which of the following increases risk for PTSD after a subsequent trauma?

- A. Prior assaultive trauma without PTSD
- B. Prior non-assaultive trauma without PTSD
- C. Prior assaultive trauma with depression but without PTSD
- D. Any prior trauma that results in PTSD

Answer: D

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