Treatment Seeking for Posttraumatic Stress in Israel Defense Forces Veterans Deployed in the 2006 Israel-Hezbollah War: A 7-Year Post-War Follow-Up

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ABSTRACT

Background: To determine the long-term prevalence of combat-related treatment seeking for PTSD in Israel Defense Force (IDF) veterans deployed to war.

Methods: A seven-year surveillance records-based study determined the prevalence of treatment seeking and DSM-IV-TR diagnosis among treatment seeking IDF veterans in relation to the 2006 Israel-Hezbollah War. The whereabouts and combat exposure of veterans during the war was determined based on the IDF's Operations Directorate records.

Results: Overall prevalence of psychological/psychiatric treatment seeking was 1.32%, and was significantly higher in soldiers deployed to high combat-exposure zones (2.19%), relative to low combat-exposure zones (0.24%), OR=9.20, CI=6.68-12.66, p<0.001. Treatment seeking did not differ between soldiers deployed in low combat-exposure zones and soldiers deployed elsewhere than the war area (0.26%), OR=0.90, CI=0.65-1.24, p=0.45: 42% of care-seeking contacts occurred within the 3.5 months of the war's end. An additional 27.9% of all contacts occurred during the ensuing year, and decreased drastically in subsequent years. PTSD was more prevalent among treatment-seeking veterans deployed in high combat-exposure zones relative to veterans who were deployed in low exposure zones or elsewhere.

Conclusions: Based on previous reports on post-combat PTSD prevalence using stratified samples, there appears to be a service-gap of anywhere between 3-11% between treatment seeking by IDF veterans following war deployment and the actual prevalence of PTSD and related symptoms in this soldier population. As in prior research, treatment seeking and PTSD strongly related to level of combat exposure.

Combat exposure is a well-recognized risk factor for post-traumatic stress disorder (PTSD) and other adjustment difficulties (1). To prepare and operate an adequate mental health care response to the sequela associated with traumatic stress symptoms in the aftermath of war, planners and policy makers must accurately estimate at least two key elements that together speak to the expected prevalence of the disorder following combat: a) the percent of veterans out of the deployed force who will actively seek or get

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treatment; and b) the number of veterans who experience severe combat-related symptoms but do not seek treatment. The former estimate can inform preparation for treatment provision whereas the latter estimate is of utmost importance for the coordination of efforts to reduce the stigma and improve willingness to receive care for mental health problems among veterans.

The study was approved by the Helsinki ethics committee in the medical corps. Recent studies suggest a considerable gap between the prevalence of potentially severe post-combat symptoms in war veterans and the prevalence of those who actually seek or get treatment. Warner et al. (2) found that reporting of symptoms and interest in receiving care were 2-fold to 4-fold higher in an anonymous survey compared with an official post-deployment health assessment survey. In this particular sample of U.S. Army infantry soldiers, 20.3% of soldiers who screened positive for depression or PTSD indicated that they were uncomfortable reporting honestly on the official screening documents. In the same vein, a study of Dutch infantry veterans of Iraq yielded 21% if anonymous self-reported prevalence of PTSD whereas structured interviews involving the same soldiers revealed a PTSD rate of only 4% (3). Finally, the estimated percentage of treatment seeking following combat dropped even lower when it is determined through surveillance of official records completed during hospitalizations and ambulatory visits to military and civilian medical treatment facilities (4).

Arguably, the above-described gap reflects barriers to treatment and would be expected to manifest in official, documented, on-record contacts with the health provision system. The prevalence of such contact is expected to be far below the prevalence of those in need of mental health services, which can be estimated in representative samples using anonymous reporting methods. Several such well-designed large scale studies exist. Prevalence estimates of PTSD in U.S. Armed Forces deployed to Iraq and Afghanistan range between 5 and 13% (5, 6). Prevalence in U.K. troops was estimated at 4% (7). Systematic post-war data on PTSD prevalence in Israel is limited. One survey of IDF veterans revealed that among those who reported having been under fire in one of Israel's wars, 16.5% were diagnosed with PTSD (8). Wald et al. (9) found that 8.1% of infantry soldiers deployed to high combat exposure zones anonymously self-reported clinical level of PTSD symptoms, relative to 5.1% of the soldiers who were deployed to lower combat exposure zones. And, prevalence of clinically diagnosed PTSD in the maneuver component of one of IDF's infantry brigades following operation Protective Edge was at 7.8% (10). Finally, rates of PTSD among prisoners of war and combat casualties recorded 20 years after the October 1973 war, arguably the most extreme of traumatic exposures in Israel's wars, was at 13% (11).

However, all these studies typically relied on self-reported combat events rather than on independent confirmation of traumatic exposure in a military setting (3). It has been documented, particularly in studies of U.S. Vietnam war veterans, that a considerable portion of those who claimed suffering from combat-related PTSD never actually saw combat, never served in a war zone, or in some cases never served in the military at all (see 12).

Thus, there is a need for a study that documents the relation between independently-confirmed traumatic exposure and treatment-seeking behavior among veterans. Moreover, there is a need for such a study to examine rates of treatment seeking over a relatively long period of time following an acute war-related traumatic exposure because: a) delayed onset can occur in some cases; b) it may take time until some veterans realize they have a problem; and c) PTSD can becomes chronic and continue for many years (13).

The current records-based study addresses the need for such research. Specifically, we made use of the highly detailed records of the IDF and the Israeli Ministry of Defense's Rehabilitation Directorate to estimates the prevalence of treatment-seeking and stress-related psychopathology among treatment seekers in relation to a temporally and geographically confined conflict. The Israel–Hezbollah War lasted 34 days, from July 12 until August 14, 2006, was restricted to Lebanon and Northern Israel, and involved airstrikes, artillery fire, and combat on the ground, which led to considerable morbidity and mortality in both Lebanon and Israel. The confined time and space of the war and the highly detailed nature of record keeping in this domain in Israel provided a unique opportunity to generate highly accurate estimates of the deployed population and their whereabouts during the war, as well as treatment seeking and PTSD among treatment seekers related to this specific war. Our goal was to describe as accurately as possible the prevalence of actual treatment-seeking behavior during the seven years that followed the war, and thereby shed light on the gap reflecting potential barriers to treatment.

METHODS

SAMPLING FRAME

The sampling frame was determined as the finite number of soldiers specifically deployed to the IDF's Northern Command to partake in the 2006 Israel-Hezbollah War.

An additional control population of soldiers who were assigned to the war effort but deployed elsewhere (i.e., not in the Northern Command where the war physically occurred) was also characterized to illuminate treatment-seeking patterns in the general soldier population in relation to the war. The exact number of soldiers deployed and the specific operational action and geographic whereabouts of their units during the war were noted and verified using official records provided by the IDF's Operations Directorate.

The surveillance period for treatment seeking and diagnosis was between August 15, 2006 (last day of the war) and August 14, 2013 (seven years after the war had ended). We surveyed the medical records of all the soldiers who sought treatment or were referred to psychiatric evaluation of any kind anytime during the surveillance period. Endpoints of analyses were: a) approach/referral related to the 2006 Israel–Hezbollah War; and b) psychiatric diagnosis based on DSM-IV-TR using a structured interview. The study was approved by the Helsinki ethics committee in the medical corps.

TREATMENT-SEEKING AND PSYCHIATRIC DIAGNOSIS

In Israel there are two official mental health providers for combat-related difficulties that are believed to respond to more than 95% of referrals related to psychopathology following combat: the IDF's Unit for Treatment of Combat-Related PTSD (UTC-PTSD) and the Ministry of Defense's Rehabilitation Directorate. Veterans are free to contact these establishments which provide treatment as needed free of charge. The UTC-PTSD provides in-house treatment and operates as a large day-clinic near the Tel Aviv metropolitan area, whereas the Ministry of Defense's Rehabilitation Directorate reimburses for care in civilian treatment facilities all across the country. In both cases, thorough and structured psychiatric evaluation is performed by a small group of experienced psychiatrists who determine diagnoses based on a structured interview that verifies DSM-IV-TR diagnostic criteria for PTSD and related psychopathology before treatment decisions are made. The diagnostic teams meet once a week to discuss current intakes and resolve any diagnostic ambiguities. The full intake and diagnostic records that accumulated during the surveillance period formed the base for determining caseness in the current report.

COMBAT EXPOSURE

Because all direct combat action between the IDF and Hezbollah occurred north and across the international border between Israel and Lebanon, combat exposure was determined high if a soldier crossed the international border into Lebanon as part of active combat maneuver (see Figure 1). Alternatively, combat exposure was determined low if a soldier was deployed in the Northern Command but remained on the Israeli side of the international border throughout the war. Soldiers in the high exposure group typically engaged in direct combat in addition to having to endure mortar and rocket fire. Soldiers in the low exposure group were exposed to mortar and rocket fire only. To validate this geo-operational index of combat exposure we measured the percent of soldiers killed and the percent of soldiers wounded during the war in the high- and low-exposure groups. These

Figure 1. *International borders are marked in brown lines. The region of conflict designated as high combat exposure is marked in light red, while the region of conflict designated as low combat exposure is marked in light orange*

records were obtained from the IDF's Medical Corps. Seventy-six percent of the war's casualties and 93% of the wounded soldiers belonged to the high exposure group relative to 24% and 7% in the low exposure group, respectively. This distribution reinforces the validity of the geo-operational index of combat exposure used in analyses. A third comparison group consisted veterans who identified their treatment-seeking as related to the 2006 war, who were part of the IDF's general force at the time of the war but based on official records were deployed elsewhere (i.e., to the south of the Northern Command). These soldiers operated within the general security mission parameters in Israel.

DATA ANALYSIS

The summary measures used in analyses were the "percent affected" in relation to two aspects: a) the number of soldiers who sought treatment within the surveillance period multiplied by 100 and divided by the number of soldiers in the relevant cohort. The relevant cohorts for treatment seeking estimates were defined based on the IDF's Operations Directorate records of the 2006 war and verified by the IDF's History Department records; and b) the number of soldiers who received a case-defining diagnosis within the surveillance period multiplied by 100 and divided by the number of soldiers in the relevant cohort again defined based on the IDF's Operations Directorate records of the 2006 war and verified by the IDF's History Department records. Although we had access to the exact number of deployed soldiers and their whereabouts during the war and to all the records of those who sought treatment after the war, all results are reported in percentages due to IDF security restrictions. We tested: a) How many of those who deployed to high combat exposure zones relative to those who deployed to low combat exposure zones, and those deployed elsewhere (i.e., out of the war's geographical area), sought treatment and were diagnosed with different psychiatric disorders; b) Odds ratios (OR) were calculated to interrogate differences between soldiers who were deployed in the Northern Command but did not cross the international border for active combat and soldiers who crossed the border.

RESULTS

TREATMENT SEEKING OVER TIME

Data on percentages of treatment seekers as a function of time elapsed from the end of the war is displayed in Figure 2; 42% of the care-seeking contacts related to the war occurred within the 3.5 months of the war's end. An additional 27.9% of all contacts occurred during the following year (2007). War-related treatment seeking decreased drastically during the subsequent years of the survey.

Figure 2. *Percentage of treatment seekers during the three and a half month following the end of the war and every year thereafter*

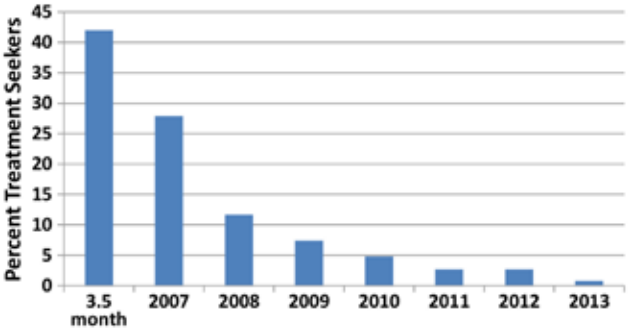

Table 1. *Treatment seeking and diagnosed psychopathology in treatment seekers in relation to the 2006 Israel-Hezbollah War. Percentages relative to the full soldier population, Odds Ratios (OR), 95% Confidence Intervals (CI), and significance are reported.*

	High Exposure	Low Exposure	Deployed Elsewhere	OR (95%CI) High vs. Low	OR (95%CI) Low vs. Elsewhere
All Treatment Seekers	2.19%	0.24%	0.26%	9.20 (6.68-12.66)*	0.90 (0.65-1.24)
PTSD	0.94%	0.05%	0.07%	20.33 (10.06-41.22)*	0.70 (0.34-1.42)
Subclinical PTSD	0.31%	0.006%	0.02%	54.21 (7.52-390.54)*	0.27 (0.04-1.93)
Anxiety Disorder	0.08%	0.03%	0.02%	2.75 (1.01-7.46)*	1.68 (0.66-4.29)
Depression	0.02%	0.00%	0.001%	4.05 (0.19-84.28)	2.28 (0.11-47.54)
Psychotic	0.02%	0.00%	0.0001%	7.28 (0.39-135.27)	3.80 (0.15-93.37)
Personality Disorder	0.04%	0.006%	0.004%	6.47 (0.81-51.76)	1.63 (0.20-13.25)

*p < 0.05, ǂp < 0.01, *p < 0.001

TREATMENT SEEKING AS A FUNCTION OF COMBAT EXPOSURE

The prevalence estimates of percentages of soldiers who sought treatment following the war as a function of combat exposure levels appear in Table 1. Overall, 1.32% of the soldiers assigned to the war effort in the IDF's Northern Command sought mental health treatment from the

two primary providers sampled here (UTC-PTSD and the Ministry of Defense's Rehabilitation Directorate). Percentages of treatment seeking were higher in soldiers who crossed the international border for active combat maneuver (2.19%) relative to soldiers who were deployed in the conflict zone (Northern Command) but did not cross the border (0.24%), OR = 9.20, CI = 6.68-12.66, $p < 0.0001$. In comparison, 0.26% of the soldiers who were deployed outside the war area (i.e., deployed elsewhere) sought treatment for the "effects of war," percentages not different to those of soldiers who were deployed in the Northern Command but did not cross the international border for active combat maneuver, OR = 0.90, CI = 0.65-1.24, $p = 0.45$. These results suggest that actual combat exposure played a pivotal role in risk for symptoms leading to treatment seeking.

To further probe the impact of combat exposure on treatment seeking we calculated treatment-seeking prevalence within a sub-group of soldiers who participated in what many consider to be the most intense combat of this war (longest, highest number of casualties). In this specific sub-group of soldiers 4.9% sought psychiatric treatment, again highlighting the impact of direct exposure and intensity of combat on treatment-seeking behavior.

PSYCHIATRIC DIAGNOSIS AS A FUNCTION OF COMBAT EXPOSURE

Relative to the total soldier population, percentages of PTSD, subclinical PTSD and anxiety disorders were significantly higher in the high combat-exposure group relative to soldiers in the low combat-exposure group (Table 1). There was low prevalence of depression, psychotic and personality disorder diagnoses and these did not vary as a function of combat exposure. Finally, the prevalence of all diagnoses did not differ between the low combat-exposure group and the group of soldiers deployed elsewhere.

DISCUSSION

The prevalence of treatment seeking in IDF soldiers in relation to the war studied here is quite low (less than 2%), and similar in magnitude to the reported prevalence of treatment seeking in the active component of U.S. military members deployed in support of operations in Afghanistan and Iraq between 2003 and 2010 (4). Both the current study and the U.S. report used official records to determine treatment seeking and psychopathology. Both studies related the prevalence of treatment seeking and psychopathology to military operational deployment records, and employed a long follow-up surveillance period (7 years). The prevalence estimates derived using these methods are considerably lower than estimates derived from rigorously conducted studies relying on self-reported surveys on probable PTSD and stress-related psychopathology and self-reported combat exposure, and in studies in which stratified sub-samples of the deployed population served as a reference for calculation (14). This potential gap between those who endure significant combat-related symptoms and those who actually seek treatment is large and calls for concerted efforts to remove barriers to treatment. In addition, studies have consistently shown a wide range of comorbidity with combat-related PTSD in IDF veterans (e.g., major depression, substance use disorder) (8, 15), highlighting the need for effective programs designed to reach out to veterans and their families after combat.

Perhaps the strongest finding in the current survey is the overpowering role of actual combat exposure on the prevalence of post-war treatment seeking. Over 90% of war-related contacts with the mental health system came from soldiers who crossed the international border between Israel and Lebanon and actively participated in combat maneuvers. The microanalysis of the most intense combat incident of this particular war indicated that treatment-seeking prevalence could rise rapidly as a function of combat intensity but even then still does not reach the expected prevalence in the exposed population.

Finally, it appears that the bulk of treatment seeking following the war occurred within the first year of its ending. This pattern concurs with reports from Solomon and Mikulincer (16) on veterans who developed combat stress response during the First Lebanon War in 1982. Planners should take this pattern into consideration when gearing up to provide mental health services after considerable military conflicts. Specifically, it appears that a larger effort should be allocated to treatment provision immediately following the war and that more resources should be allocated to reach-out programs in the ensuing years, particularly targeting veterans who fought under high combat exposure conditions. Such reaching-out policy was recently implemented by the IDF following operation Protective Edge in 2014. The success of this effort still awaits further research.

In conclusion, the current study reveals important characteristics of treatment-seeking behavior in soldiers following war deployment. In particular, the inherent gap between the prevalence of treatment seeking and

the actual prevalence of severe combat-related symptoms revealed here requires both more research to determine its actual magnitude and for immediate and concerted efforts to reduce barriers to treatment, such as the stigma on those who need such care (17).

All authors report no competing interests.

References

1. Sofkoa AC, Curriera MJ, Drescherb DK. Prospective associations between changes in mental health symptoms and health-related quality of life in veterans seeking posttraumatic stress disorder residential treatment. Anxiety, Stress Coping 2016;29:630-643.
2. Warner CH, Appenzeller GN, Grieger T, et al. Importance of anonymity to encourage honest reporting in mental health screening after combat deployment. Arch Gen Psychiatry 2011;68:1065-1071.
3. Engelhard IM, Van den Hout MA, Weerts J, et al. Deployment-related stress and trauma in Dutch soldiers returning from Iraq: Prospective study. Br J Pschiatry 2007;191:140-145.
4. Anonymous. Associations between repeated deployments to Iraq (OIF/OND) and Afghanistan (OEF) and post-deployment illnesses and injuries, active component, U.S. Armed Forces, 2003-2010. Armed Forces Health Surveillance Center Medical Surveillance Monthly Report (MSMR) 2011;18:2-12.
5. Kok BC, Herrell RK, Thomas JL, Hoge CW. Posttraumatic stress disorder associated with combat service in Iraq or Afghanistan reconciling prevalence differences between studies. J Nerv Ment Dis 2012;200:444-450.
6. Smith TC, Ryan MAK, Wingard DL, et al. New onset and persistent symptoms of post-traumatic stress disorder self reported after deployment and combat exposures: Prospective population based US military cohort study.BMJ 2008;336:366-371.
7. Fear NT, Jones M, Murphy D, et al. What are the consequences of deployment to Iraq and Afghanistan on the mental health of the UK armed forces? A cohort study. Lancet 2010;375:1783-1797.
8. Skodol AE, Shwartz S, Dohrenwend BP, et al. PTSD symptoms and comorbid mental disorder in Israeli war veterans. Br J Psychiatry 1996;169:717-725.
9. Wald I, Degnan AK, Gorodetsky E, et al. Attention to threats and combat-related posttraumatic stress symptoms. JAMA Psychiatry 2013;70:401-409.
10. Wald I, Bitton S, Levi O, et al. Acute delivery of attention bias modification training (ABMT) moderates the association between combat exposure and posttraumatic symptoms: A feasibility study. Biol Psychol 2016:1-5.
11. Solomon Z, Neria Y, Ohry A, Waysman M, Ginzburg K. PTSD among Israeli former prisoners of war and soldiers with combat stress reaction: A longitudinal study. Am J Psychiatry. 1994;151:554-559.
12. McNally JR. Progress and controversy in the study of posttraumatic stress disorder. Annu Rev Psychol 2003;54:229-252.
13. Waller M, Charlson FJ, Ireland REE, Whiteford HA, Dobson AJ. Time-course of PTSD symptoms in the Australian Defence Force: A retrospective cohort study. EpidemiolPsychiatrSci 2016;25:393-402.
14. Sundin J, Fear NT, Iversen A, Rona RJ, Wessely S. PTSD after deployment to Iraq: Conflicting rates, conflicting claims. Psychol Med 2010;40:367-382.
15. Bleich A, Solomon Z. Psychiatric evaluation of mental disability for post-traumatic injuries in the ministry of defence. In: A Bleich & Z Solomon, editors. Mental disability: Medical research, legal and rehabilitative aspects. First ed. Tel Aviv: Ministry of Defence, 2002.
16. Solomon Z, Mikulincer M. Trajectories of PTSD: A 20-year longitudinal study. Am JPsychiatry 2006;163:659-666.
17. Hoge WC, Castro AC, Messer CS, et al. Combat duty in Iraq and Afghanistan: Mental health problems and barriers to care. N Engl J Med 2004;351:13-22.