Combat Experience and Mental Health in the Israel National Health Survey

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ABSTRACT

Objective: To compare the mental health status of those who participated in combat related activities during their service with that of soldiers whose army service did not include combat related activities

Method: A representative sample extracted from the National Population Register of non-institutionalized residents aged 21 or older of Israel was used in this cross-sectional survey. Data on mental health disorders, socio-demographic background and army service were collected using face-to-face computer-assisted interviews.

Results: Combat experience per se was not associated with lifetime diagnosis of PTSD. Former combat soldiers had significantly lower lifetime prevalence and 12 months prevalence of any mood or anxiety disorders including PTSD.

Conclusion: This work is in line with previous literature showing that combat exposure, as such, has limited contribution to lifetime PTSD in some groups of veterans. The inverse relationship between combat exposure and PTSD might be explained by the selection of potential combatants among all recruits and by the heightened preparedness to military life stressors.

INTRODUCTION

The American military experience since World War II triggered a wave of research on the mental health effects of war on the participating soldiers. That wave resulted in the inclusion of PTSD in DSM-III (1) and in the current assumption that military activities results in higher rates of PTSD symptoms (2).

Combat exposure and the related military and personal context, however, may differ between armed services and nations in war: In the Israeli case, episodes of highly stressful combat are relatively short and they take place close to Israeli civilian population. This experience leads to the principles of therapeutic intervention in combat PTSD patients which were formulated in the Israel Consortium on PTSD recommendations (3). Hence the assertion that combat exposure is an immutable risk factor for PTSD may not be sustainable. Within this context, a national survey of mental disorders in Israel permits assessment of the effect of combat exposure within the IDF.

Previous studies of IDF soldiers concentrated primarily on the assessment of risk factors for PTSD, epidemiology of stress-related disorders, and on the efficacy of intervention models (4-8). One exception was a longitudinal study of the prevalence of PTSD after the 1982 Lebanon war (9) which showed prevalence rates of 15%, 17% and 9% after one, two and three years from the war, respectively. That study, based on combat veterans with immediate combat stress disorders and a comparison group from equally exposed soldiers, could not properly address the generic effect of combat exposure as such across war events in Israel.

The present paper evaluates the contribution of combat exposure to PTSD and other mental disorders in a nationally representative sample of the general population of adults in Israel. The study compares the mental health status of those who participated in combat related activities (CRA) during their service with that of soldiers whose army service did not include combat related activities (NCRA).

METHOD

SAMPLE

The Israeli survey is part of the World Health Organization (WHO) World Mental Health (WMH) Surveys Initiative and followed the procedures established by it. The sample was extracted from the National Population Register

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and comprised non-institutionalized de jure residents aged 21 and above. The sample was representative of the adult population, reflecting its distribution by gender, age group and major population group. This last includes Jews and others (born in Israel, or pre-1990 immigrants or post-1990 immigrants from countries other than the former USSR), Arabs, and post-1990 immigrants from the former USSR.

On first personal contact with each potential survey respondent, the interviewer explained the survey and obtained verbal informed consent (8). Overall, 73% of those contacted agreed to be interviewed (88% of Arab-Israelis and 71% of Jewish-Israelis). If a person refused to participate, no replacement was made. A total of 4,859 face-to-face interviews were conducted in Arabic, Hebrew or Russian at respondents' homes from May 2003 to April 2004. Professional interviewers, who were trained and supervised by Israel's Central Bureau of Statistics, used laptop-based computer-assisted personal interview methods. The interviews lasted an average of 60 minutes. The Human Subjects Committee set up in Eitanim - Kfar Shaul Hospital approved the survey and the field procedures in November 2000 (10).

MEASURES
ARMY SERVICE
Questions about army service were presented to the entire sample. Those who served in the army were asked whether they participated in combat related activities. This question was used to form the two main groups of the present study. The combat related activities (CRA) soldiers and the non-combat related activities soldiers (NCRA).

DIAGNOSTIC ASSESSMENT
The diagnostic instrument applied in the World Mental Health Survey (WMH) was the CIDI (9), a fully structured diagnostic instrument which assesses lifetime and recent prevalence of selected psychiatric disorders according to both the tenth version of the International Classification of Diseases (ICD-10) and the fourth version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). In our survey the following disorders were assessed: anxiety disorders (panic disorder, generalized anxiety disorder [GAD], agoraphobia without panic disorder, and post-traumatic stress disorder [PTSD]), mood disorders (major depressive disorder, dysthymia, bipolar I and II disorders) and substance abuse disorders. The presence of mental disorder was determined by whether respondents' past

or current symptoms met the 12-month and/or lifetime diagnostic criteria for DSM-IV disorder. For each disorder, a screening section was administered to each respondent. All participants answering positively to a specific screening item were asked the questions of the respective diagnostic section of the questionnaire. Organic exclusion criteria were taken into account in the determination of the DSM-IV diagnoses. The validity of the WMH-CIDI was assessed in France, Italy, Spain, and the U.S. by a clinical reappraisal study (11). The reappraisal study aimed to determine whether the diagnoses generated by the WMH-CIDI were consistent with those obtained independently by trained clinicians who administered the Structured Clinical Interview for DSM-IV (SCID) to a sub-sample of survey respondents who previously completed the WMH-CIDI. The 12-month individual-level CIDI-SCID concordance for 12-month prevalence was substantial (AUC in the range 0.8–0.9) for any mood disorder, any anxiety disorder and any overall disorder (12).

CHRONIC PHYSICAL CONDITIONS
The INHS included a checklist of chronic physical disorders and chronic pain. Respondents were asked whether they ever experienced having each of the symptom-based conditions in the checklist and, if so, whether they experienced them at any time in the past 12 months. In the case of conditions typically identified by medical diagnosis, respondents were asked whether a doctor or other health professional ever told them they had the condition and, if so, whether they still had the condition in the past 12 months. The 12-month follow-up questions were omitted for conditions that persist throughout the life course.

In this analysis, all chronic physical conditions were grouped into a two categories variable: reporting any one of the conditions or reporting none. The chronic physical conditions in the list included the following: heart attack, heart disease, stroke, high blood, asthma, COPD, emphysema or other lung disease ever, tuberculosis in the past year, diabetes, kidney disease, neurological conditions, thyroid disease or cancer, arthritis/rheumatism, or chronic back or neck pain, headaches or any other chronic pain in the past year.

Methodological research has shown that such checklists provide useful information about treated or currently untreated chronic conditions (13).

EXPOSURE TO POTENTIALLY TRAUMATIC EVENTS
The CIDI PTSD section opened with questions about lifetime occurrence of 27 Potentially Traumatic Events (PTEs)

and an additional "private" event. The latter enquires about "a traumatic event that you didn't report to me because you didn't want to talk about it." Respondents were further asked about the age of onset and the number of occurrences of PTE.

Following completion of the PTE, a randomly selected occurrence of a randomly selected PTE that was reported by the respondent was used to ask about reactions following the exposure to the event in order to assess the lifetime prevalence of PTSD according to DSM-IV criteria. If, according to the interviewee, the random event was not followed by above threshold reactions, the interview continued to ask about reactions to the worst event.

The present questionnaire uses "random" events to estimate the prevalence of PTSD following exposure to different PTEs, to avoid the bias that might arise from choosing PTEs that were reported as "worst" events. The use of worst events could have overestimated the proportion of PTSD among exposed persons.

ANALYSIS METHODS

The data were weighted to adjust for the differential probabilities of respondents' selection and nonresponse and for differences between the sample and the adult population in Israel Statistical Analysis.

Assessing the probability of PTSD conditional on a specific event

All events and all occurrences were used to create the representative dataset for the country. This dataset enabled the calculation of the proportion of an event as a percentage of all PTEs and the probability of PTSD conditional on a specific event.

Cross-tabulations examined frequency of individual PTEs and conditional prevalence of DSM-IV PTSD on individual PTEs and categories of PTEs.

Comparisons between former IDF soldiers who participated in combat related activities vs. those who did not participate in such activities

Chi-squared comparisons between men who served in combat related units and those who served in non-combat related units on demographic variables and DSM-IV diagnoses were calculated on the basis of weighted data, along with estimates of standard errors with SUDAAN (14).

The sample size had power of $1-\beta=80\%$ with $\alpha=0.05$ to detect a difference of 16% vs 24% rates of any lifetime mood or anxiety disorder.

RESULTS

EXPOSURE TO POTENTIALLY TRAUMATIC EVENTS

Table 1 presents the rates of exposure to the 25 potentially traumatic events reported by respondents. About 75% of the populations were exposed to at least one of the listed events.

The most prevalent type of events were the unexpected death of a loved one which was reported by 38% of the respondents, "network" events (events that happen to family or relatives) (35.1%) and accidents (30%). Combat experience was reported by 10.8% of the sample.

Table 1. *Potentially Traumatic Events (PTEs): Lifetime Exposure and probability of PTSD among those exposed [%, se]*

Types of events	% of respondents with event (%, se)	Probability of PTSD among PTEs (%, se)
No events	25.2	
Combat experience	10.8(0.47)	0.54 (0.25)
Other war events[1] [Refugee, seriously injured/ killed a person during service in the army, present during a terror attack [suicide bomber], explosion **person during service in the army**	22.2(0.63)	0.1(0.06)
Physical violence [Kidnapped, beaten up by caregiver, by spouse or romantic partner, by someone else, mugged or threatened with a weapon]	15(0.51)	4.2(2.83)
Sexual violence [Raped, sexually assaulted, stalked]	11.6(0.47)	2.2(1.67)
Accident [Toxic chemical exposure, automobile accident, other life threatening accident, natural disaster, manmade disaster, life-threatening illness]	30.4(0.67)	5(2.75)
Unexpected death of loved one	38.3(0.76)	3.4(1.83)
Network events [child's illness, trauma to loves one, witnessed death/dead body, or saw someone seriously hurt, accidentally caused serious injury or death]	35.1(0.7)	0.2(0.08)
Other [Family had an incident that caused deep shame to everybody, private event]	12.3(0.52)	0.6(0.32)
Total with any event	74.8(0.61)	2.3(1.46)

[1]Percent of respondents includes those with combat experience

The probability of a lifetime PTSD in the entire sample of Israel was 2.3 %, when checked within the groups reported the different types of events, the probability increased among those who had accidents (5%), suffered from physical violence (4.2%), or experienced the unexpected death of loved ones (3.4%). The probability of PTSD among those who had combat experience was 0.54%.

COMPARISONS BETWEEN FORMER IDF SOLDIERS WHO PARTICIPATED IN COMBAT RELATED ACTIVITIES VS. THOSE WHO DID NOT

All respondents were classified as those who served or those who did not serve in the army. Among those who had served, respondents were grouped into those who participated in combat related activities during their service and those who did not.

There were 1,085 respondents who participated in combat related activities. Most (98%) of them were Jewish and 93% were male: 42% of them participated in combat or combat related activities during major wars (3.6% in 1948, 5.6% in 1956, 10.5% in 1967, 11.3% in 1973 and 11.3% in 1982), while the others had participated in combat activities in the periods in between; 14% (n=157) of them were injured during their service, most (n=116) were hospitalized because of the injury and 60 of them receive disability benefits.

Because most of the participants with combat related activities were males, Table 2 presents the demographic and mental health differences between those who participated in combat related activities during their service and those who did not, *among males only*.

There were few differences between those who participated in combat or other military activity during their service (CRA) and those who did not (NCRA). Table 2 shows that 54% of the NCRA group is less than 35 years old whereas only 31% of the combat group is in that age group. Correspondingly, the size of the 65+ age group among the combat group is double (13.9%) the size of that group among the NCRA (6.7%).

Table 2. *Demographic characteristics of those who served in the IDF by type of service*

	Total Sample			Total Men			Served in combat units						
							No			Yes			
	N	%	SE	N	%	SE	N	%	SE	N	%	SE	
	4859	100	0	2356	100	0	511	100	0	1014	100	0	
Age													p=0.0000
21-34	1585	35	0.29	564	38.79	0.71	271	54.17	1.95	293	30.81	1.18	
35-49	1317	27.8	0.43	437	29.04	0.85	142	27.5	1.85	295	29.84	1.24	
50-64	1080	21.5	0.38	338	20.71	0.73	63	11.6	1.29	275	25.43	1.1	
65 <=	877	15.8	0.24	186	11.46	0.53	35	6.73	1.08	151	13.92	0.82	
Income													p=0.01
Low	773	18	0.59	140	10.2	0.85	64	13.26	1.57	76	8.62	1	
Low-Average	1472	32	0.73	416	29.41	1.22	151	31.75	2.16	265	28.2	1.49	
High-Average	1717	34	0.7	601	39.39	1.28	177	34.76	2.16	424	41.79	1.62	
High	897	16	0.53	368	20.99	1.06	119	20.23	1.72	249	21.39	1.35	
Family Status													p=0.0000
Married/Cohabiting	3229	67.8	0.64	1002	66.48	1.04	283	56.87	2.12	719	71.47	1.33	
Sep./Widowed/Divorced	730	13.4	0.45	113	6.34	0.59	33	5.57	0.97	80	6.73	0.74	
Never Married	900	18.7	0.48	410	27.18	0.91	195	37.56	2.02	215	21.8	1.17	
Education													NS
Low	1068	21.7	0.6	243	15.63	0.97	75	14.33	1.58	168	16.31	1.22	
Low-Average	1728	36.9	0.72	639	42.22	1.27	224	43.66	2.22	415	41.48	1.6	
High-Average	800	16.2	0.54	282	18.57	1.03	92	18.4	1.75	190	18.65	1.26	
High	1263	25.3	0.66	361	23.58	1.14	120	23.61	1.95	241	23.56	1.38	
Employment status													p=0.04
Employed	2857	56.1	0.68	1096	69.07	1.19	373	70.13	2.06	723	68.51	1.51	
Unemployed	298	6.46	0.38	91	6.59	0.7	42	8.56	1.27	49	5.57	0.82	
Does not belong to the workforce	1704	37.4	0.65	338	24.34	1.09	96	21.31	1.89	242	25.92	1.39	
Any chronic physical condition													NS
Any chronic physical condition	2391	48.2	0.72	620	40.17	1.3	196	37.46	2.15	424	41.58	1.65	

The difference in income and employment was due mainly to a difference between the groups in the income and employment of the 21-34 age group. In the youngest group 15% of the NCRA had low income and 11.6% of them were unemployed compared to only 6.9% of the combat group with low income , and only 5.5% who were unemployed. The 21-34 age group had individuals who were out of the workforce: 18.6% among the NCRA and 26.3% among the combat group. In the other age groups, there were no significant differences between the combat and NCRA groups in income or employment.

Differences in family status were significant only among the 65+ age group. The combat group had more widowers/ divorced respondents (18.2%) than the NCRA (4.7%) and fewer respondents who had never married (1.1%) than the NCRA (9.4%).

Table 3 presents prevalence rates of mental disorders among the combat vs NCRA groups. The combat group has significantly lower lifetime prevalence of any mood or anxiety disorders (16.7% vs. 24.5%) in particular lower lifetime prevalence of PTSD (0.54% vs. 2.4%).

The combat group has also significantly lower 12-month prevalence of any mood or anxiety disorders (7.4% vs. 12.2%) and lower 12-month prevalence of PTSD (0.12% vs 1.75%)

In the questions regarding reactions to potentially traumatic events in the past, there were no differences between the combat and the NCRA groups.

DISCUSSION

The purpose of the present paper was to compare the mental health status of former IDF soldiers who participated in combat related activities with that of former soldiers whose army service did not include combat activities.

Both groups were part of a representative sample of the 21 and above adult population, in its distribution of age, gender and population group. Thus, both samples of former IDF groups are representative of their respective populations in the adult population of Israel.

The main findings of the analysis were:

Unlike accidents or personal acts of violence, combat experience per se was not associated with lifetime diagnosis of PTSD.

Former combat soldiers had significantly lower lifetime prevalence and 12 months prevalence of any mood or anxiety disorders including PTSD.

COMBAT VS OTHER POTENTIALLY TRAUMATIC EVENTS

It was already established that different types of events are associated with different conditional risk for developing PTSD. Crime-related traumas carried a higher risk for PTSD than did non-crime trauma (15, 16) and combat exposure was found to be the most associated with PTSD for men (2).

In our case though, the opposite was found. Exposure to combat like events was associated with fewer traumas compared to other potentially traumatic events such as accidents or acts of physical violence. One possible explanation might be that in the Israeli context, military stressful events carry existential meaning which is related to a historic narrative. Unlike other types of traumatic events like car accidents which are infuriating in their meaningless, military activities are perceived as defensive activities, and as Friedrich Nietzsche wrote: "If a human being knows why, he can bare almost all How."

SOLDIERS IN CRA UNITS VS THOSE IN NON-CRA UNITS

The finding that soldiers in CRA units suffer less from mental health disorders including PTSD replicates results that were found among military units in other countries such as the U.K. (17), Sri Lanka (18) and the U.S. (19), and was already labeled the "healthy warrior effect," referring to the fact that only those persons who have proven their resilience during training remain eligible for combat.

Soldiers in combat related activities units in Israel are selected rigorously and are trained specifically to face the

Table 3. *Mental disorders and reactions to potentially traumatic events among those who served in the IDF by type of service*

| | Total Sample | | | Total Men | | | Served in combat units | | | | | | |
| | | | | | | | No | | | Yes | | | |
	N	%	SE	N	%	SE	N	%	SE	N	%	SE	
Any mood/Anxiety [lifetime]	927	18.95	0.59	295	19.3	1.0	126	24.5	1.9	170	16.67	1.21	p=0.0006
Any mood/Anxiety [12 months]	470	9.78	0.45	137	9.0	0.7	63	12.2	1.4	74	7.38	0.84	p=0.043
PTSD lifetime	67	1.46	0.19	16	1.17	0.3	20	2.4	0.7	5	0.54	0.25	p=0.05
PTSD 12 Months	23	0.56	0.12	11	0.52	0.16	10	1.75	0.27	1	0.12	0.12	p=0.06

expected combat stress. Also, the cohesiveness of the units and the leadership in them helps to buffer the effects of the potentially traumatic events in the Israeli army, as well as in combat units in other countries (17-19). The social context of the combat activity was checked on soldiers of the Yom Kippur War in Israel by Steiner and Neumann (19). They found that compared to soldiers who were fighting with their original units, soldiers who needed to change teams or to fight without their original teams were more likely to suffer from PTSD.

The fact that the CRA group is highly selective compared to the non-CRA group can be seen also in the socio-demographic characteristics of the two groups. The results show that the CRA group had a higher average income and their marriage rates are significantly higher.

The very low rates of PTSD (Table 1 "0.54") among those participating in CRA should not be interpreted to mean that combat is not one of the most disturbing events one can experience. This low figure indicates rather that in the general society, there are more types of events that might lead to long-term disorders.

The low rates of PTSD relative to the much higher prevalence rates of mood or anxiety disorder (7.38% and 16.67 % for 12-month and lifetime prevalence respectively) may reflect the fact the PTSD is only one type of disorder emanating from trauma and that it is much less common than mood or anxiety disorders. The low rates of PTSD might be explained also by the delay between combat exposure and the assessment of symptoms. This was found in Solomon (8) which revisited subjects 18 years after the initial assessment and found that the level of distress among subjects who initially suffered from combat stress reaction declined over time. And among prisoners of war (20) who experienced a considerable decline in PTSD symptoms over the years.

In conclusion, our results might indicate that interventions to increase resilience could have the potential to buffer the expected impact of potentially traumatic events. This study has some important limitations due to the retrospective and cross-sectional design.

The division into combat related group and non-combat related group can probably be trusted although the extent of exposure to war-like stressors within the CRA group cannot be verified. Thus, it is possible that the CRA groups in this survey were not exposed to the worse possible conditions and therefore experienced fewer traumas. Problems of recall or other memory biases may have also contributed to the minimization of the effects of combat experiences. Thus, it is possible that some members of the CRA group

had acute stress response (ASR) to their circumstances but did not develop a chronic PTSD.

Due to the cross sectional design one cannot rule out the possibility that the assignment of soldiers into CRA units paved the way into socially better positions adding to the resilience against future stressors.

The strengths of the present study are the large, representative sample of the adult population of Israel from which the former IDF soldiers were drawn, the relatively high response rate, the use of face to face interviews via computer-aided programs which increased the data quality, the long time frame for post-war experience effects (3-56 years) and the use of widely accepted clinical instruments to assess psychiatric diagnoses.

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