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Prevalence of Somatic and Psychiatric Disorders Among Former Prisoners of War

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American former prisoners of war (POWs) are an aging group who seek health care with increasing frequency. To examine the prevalence of long-term physical and emotional consequences of captivity in this population, the authors analyzed medical and psychiatric examination data for 426 former POWs. Detailed psychiatric diagnostic criteria were used to assess the POWs' mental health. Compared with general population groups, POWs had moderately elevated lifetime prevalence rates of depressive disorders and greatly elevated rates of posttraumatic stress disorder (PTSD), although their rates of hypertension, diabetes, myocardial infarction, bipolar disorder, schizophrenia, and alcoholism were not elevated. POWs who lost more than 35 percent of their body weight during captivity had higher rates of anxiety disorder, depressive disorders, PTSD, and schizophrenia, compared with other POWs.

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Clinicians and researchers have recently shown renewed interest in the health problems of former prisoners of war (POWs) (1–5). An estimated 73,435 American former POWs were alive in 1990 (6). Many POWs suffered from malnutrition, untreated disease, torture and beatings, and related psychological trauma during imprisonment. As they age, they seek health care in increasing numbers in both the public and private sectors.

Accurate knowledge about the somatic and psychiatric morbidity of POWs may improve health care providers' sensitivity to the special health problems POWs may present. Research to date on this subject lacks direct implications for medical practitioners, despite recognition that the trauma suffered by a patient while a POW may cause serious physical and emotional impairments.

Even though POWs who survived captivity were likely to have been more physically and emotionally resilient before captivity than nonsurvivors, follow-up studies have shown both elevated mortality and considerable ongoing physical and psychiatric morbidity among former POWs. Several studies have provided mortality data on American POWs who served in World War II and the Korean War (7–9). Cohen and Cooper (7) compared American POWs captured during World War II with World War II combat and noncombat veterans and found a higher rate of mortality, primarily due to tuberculosis and accidents during the first six years after liberation, only among POWs who had served in the Pacific theater.

Keehn (9) found excess mortality,

due to trauma, among POWs captured during the Korean War, although no evidence of "increased aging" (mortality from chronic and degenerative diseases) was found among former POWs. POWs held in Europe and the Pacific theater during World War II and in Korea had a high rate of death due to cirrhosis of the liver after the tenth follow-up year. The role of psychiatric disorders and alcohol abuse in excess mortality from trauma, suicide, or cirrhosis was not explored. The finding of excess deaths from trauma parallels recent reports of excess mortality from trauma among Vietnam combat veterans (10).

POWs who were held in the Pacific theater during World War II and in Korea were more physically and psychiatrically disabled than those held in Europe during World War II (11). These differences were attributed to the harsher treatment POWs suffered at the hands of the Japanese and Koreans. POWs held in Asia were more likely to suffer from tuberculosis, peptic ulcers, and other infectious and parasitic diseases. Increased mortality was found among Canadian POWs of the Japanese from tuberculosis, accidents, violence, and coronary artery disease, although cardiovascular disease rates were below those of the general population (12). An elevated general mortality rate was found among Australian POWs of the Japanese, especially five to 14 years after release (13).

Knowledge of POWs' psychiatric status is sketchy because most follow-up studies used broad diagnostic categories or rating scales. An excess of "psychoneurosis" and "psychosis" was reported among POWs held in the Pacific theater during World War II, but not among POWs held in Europe (7). Anxiety reactions, somatization, and schizophrenia, as then defined, were especially common among POWs held in the Pacific theater during World War II and among those held in Korea (11). Compared with POWs held in Europe and with non-POW combat veterans, POWs held in Asia were more likely to have depressive symptoms 30 to 40 years after release (14). These symptoms were linked to somatic symptoms and to weight loss experienced during captivity.

Australian POWs held in Asia experienced elevated rates of anxiety and depressive disorders, but not alcoholism (15). In another study, *DSM-III* criteria for posttraumatic stress disorder (PTSD) and criteria from the Schedule for Affective Disorders and Schizophrenia–Lifetime Version (SADS-L) (16) were used to make retrospective psychiatric diagnoses for 188 American POWs who served in World War II (2). Generalized anxiety and depressive disorders were common. Within one year of their release, 66 percent of the sample met criteria for PTSD; 47 percent continued to have symptoms more than 40 years later. In comparison, a PTSD prevalence rate of 35.8 percent was found among Vietnam veterans who had been exposed to heavy combat (17).

Speed and associates (5) suggested that the prevalence of PTSD among POWs who served in World War II could be attributed to torture or beatings and weight loss during captivity. They found that evidence of the disorder was independent of preservice adjustment problems, family history of mental illness, or severe childhood trauma. Twenty percent of these POWs were unaffected by their POW experience despite experiencing hardships in captivity that were comparable to those experienced by others in the sample (18). Vietnam-era POWs with predisposing factors, such as a history of individual or family adjustment problems before captivity, were more likely to develop psychiatric disorders (19), and Vietnam combat veterans with childhood behavioral problems were at greater risk of developing PTSD (20).

Although debate about the role of specific stressors in the development of psychiatric disorders continues (21–23), it appears that many people exposed to extreme trauma develop some chronic psychological symptoms. A smaller but significant proportion develop persistent and diagnosable mental disorders, but some experience few, if any, symptoms. Consistent with this viewpoint, the U.S. Department of Veterans Affairs (VA) considers the psychiatric conditions of anxiety states (including PTSD), depressive neuroses, and psychoses in POWs to be "presumptive"; that is, when the condition is present, the VA presumes it was caused by the veteran's POW experience.

Previous studies of American POWs' mortality and morbidity are primarily of historical interest and are of limited use in understanding the current health problems of that population. Many studies of POWs' mortality have a limited follow-up period, and studies of morbidity lack comparisons of POWs' health status with that of samples of the general population matched for age and gender. In addition, most comparisons in these studies are between groups of POWs and non-POW combat veterans. This approach distinguishes the health sequelae of the POW experience per se from those of combat experience, a useful distinction for clinicians who routinely work with both groups. However, most clinicians have only a general knowledge of the potential effects of combat and little knowledge of health problems specific to POWs.

Comparisons of POWs with general population groups of similar age can help clinicians recognize health problems related to the POW experience. Some of these problems may be responsive to alternative treatment approaches. For example, a preferred treatment for a POW who presents with a chronic sleep disturbance may be participation in a POW support group plus a trial of tricyclic antidepressants (24), while a nonveteran patient with a sleep disturbance typically might be offered a trial of a benzodiazepine.

Another limitation of existing research on POWs is that, with one exception (2), studies did not use standardized psychiatric diagnostic criteria, significantly limiting the clinical and theoretical understanding of the long-term psychiatric sequelae of the POW experience.

This report presents results of a regional survey of the physical and psychiatric health of 426 POWs examined between April 1984 and

April 1987. The sample constitutes the largest group of American POWs examined to date. The study includes subjects (N=188) from an earlier report (2) and expands the scope of the earlier study to include data on physical as well as psychiatric disorders. The study highlights health problems specifically related to the POW experience, uses detailed psychiatric diagnostic criteria to assess POWs' mental health, and compares the health status of POWs with that of samples of the general population. Strategies for improving physical and mental health care of former POWs are recommended.

Methods

The 1981 Former Prisoners of War Act (Public Law 97-37) offered complete health examinations and specific benefits to all former POWs. Repatriation records were used to identify all surviving former POWs, and all who could be located were contacted to request their participation in free examinations and follow-up treatment. Nationwide, more than 25,100 former POWs completed examinations using a protocol that included a standardized medical history questionnaire (25). Reports based on samples developed through this process have appeared elsewhere (2,4,5,9,26).

The administrative region of the Department of Veterans Affairs that includes most of Minnesota and portions of western Wisconsin was thoroughly canvassed, leading to a high participation rate. The examinations continue, and 528 (76 percent) of the 696 POWs known to be living in the region have been examined to date. A total of 102 POWs who were examined are not included in this report. Six had records that were not available due to permanent transfer, and three refused the psychiatric exam. The mental health of the remaining 96 POWs could not be assessed because a psychiatrist was not available on the day of the POW's scheduled examination.

The 426 POWs on whom this paper reports are representative of surviving POWs in the Minneapolis VA region. Study participants were comparable to nonparticipants in age, education, marital status, and service-related disability status. Nonparticipants' reasons for not receiving the health examinations could not be determined; they may have been severely incapacitated by non-service-related disabilities or simply may not have been interested in the study.

POWs reported for examination in proportions comparable to national estimates of the proportions of POWs held at various sites (6). A total of 81 percent of the sample had been held by Germany, compared with 82.2 percent of the national population of POWs; 15 percent of the sample had been held by Japan, compared with 17.4 percent of the national population; and 4 percent by Korea, compared with 4.3 percent of the national population. Few POWs who served in World War I or in the Vietnam War live in the Minneapolis region, and they were not expected to participate in meaningful numbers.

All POWs completed a detailed medical history form and social history interview and received medical and psychiatric examinations. The ten examining psychiatrists were experienced in the diagnosis of psychopathology among POWs and combat veterans. They were assigned to the POW examination process based on their interest and availability. They elicited psychiatrically relevant data on POWs' premilitary history, military and POW experiences, postmilitary adjustment, and current psychiatric status. Historical and current diagnoses (if any) were based on this information. POWs were randomly assigned to examining psychiatrists.

Some of the examining psychiatrists used the Research Diagnostic Criteria of the SADS-L (27) and a PTSD symptom checklist based on *DSM-III* criteria. A total of 276 POWs (65 percent of the sample) were examined using these instruments. For the remaining 35 percent whose examinations did not include use of the SADS-L and PTSD checklist, the authors reviewed written psychiatric, social, and medical findings to derive SADS-L and PTSD diagnoses. Independent agreement was reached for 122 cases, and a consensus was reached for the remaining 28.

Frequencies of the diagnoses obtained using the SADS-L and the PTSD checklist were comparable to frequencies obtained from review of the records. For example, diagnoses of PTSD constituted 35.5 percent of the diagnoses made using the instruments and 34.6 percent of those made using the records. Diagnoses of generalized anxiety disorder accounted for 48.1 percent of the diagnoses made using the instruments and 49.3 percent of those obtained from review of the records. Diagnoses of alcoholism constituted 19.2 percent of the diagnoses made using the instruments and 24.7 percent of those made after review of the records.

Both rating methods were used for a sample of 30 cases. Complete agreement about the presence or absence of the psychiatric diagnostic categories used in the study was obtained in 23 cases (77 percent), and partial agreement was obtained in the remaining seven cases. Raters agreed on the presence or absence of PTSD in 29 of 30 cases, of major or minor depression in 28 of 30 cases, and of alcoholism or alcohol abuse in 26 of 30 cases.

To develop lifetime prevalence estimates of somatic disorders, experienced coding personnel reviewed the POW medical examination reports to identify disorders occurring anytime after repatriation through the time of examination. The coding system defined under Title 38 of the U.S. Code, which covers veterans' pensions, bonuses, and relief compensation, was used.

We hypothesized that no difference between POWs and men of similar ages would be found in the prevalence of somatic disorders, bipolar disorder, schizophrenia, and alcohol use disorders. We predicted higher rates of depressive and posttraumatic disorders among POWs, compared with men of similar ages, and we expected that the rates within the POW group would be highest for those with the greatest weight loss during captivity. We also predicted higher rates of depressive, posttraumatic stress, and generalized

Table 1
Lifetime prevalence rates of somatic and psychiatric diagnoses among samples of the general population and former prisoners of war (POWs) (N=426), in percentages

Diagnosis	General population	POWs
Somatic conditions		
Hypertension	40.4[1]	39.2
Diabetes mellitus	13.2[2]	8.9
Cerebrovascular accident	6.4[3]	.9
Myocardial infarction	15.5[3]	7.6
Intermittent claudication	2.1[4]	1.9
Psychiatric conditions		
Major or minor depression	16.5[5]	23.3
Bipolar I or bipolar II disorder	1.2[5]	.9
Alcohol abuse or dependence	18.2[6]	21.1
Schizophrenia and schizophreniform disorder	1.1[7]	1.9
Posttraumatic stress disorder	.5[8]	70.9

[1] Source: National Institute on Aging (28); N=2,974 men
[2] Source: National Institute on Aging (28); N=3,017 men
[3] Source: National Institute on Aging (28); N=2,957 men
[4] Source: National Institute on Aging (28); N=2,949 men
[5] Estimated from Tables 2 and 4, Weissman and Myers (29); N=130 men aged 46 and older
[6] Estimated from Table 6, Robins and associates (30); N=2,016 men aged 45 and older
[7] From Table 6, Robins and associates (30); N=3,816 men aged 18 and older
[8] Source: Helzer and associates (20); N=965 men aged 18 and older

anxiety disorders among POWs who were held in the Pacific theater during World War II and in Korea, given their higher levels of maltreatment in captivity.

Results

The POWs' lifetime prevalence rates for five somatic conditions are shown in Table 1. Frequencies of these diagnoses among men in the general population sampled by the National Institute on Aging (28) are also presented. Hypertension, diabetes, and myocardial infarction were included because they are commonly reported in the general population. Cerebrovascular accident and intermittent claudication also are included as conditions related to myocardial infarction and hypertension, and because comparative data for the general population were available. The lifetime prevalence of these common conditions among the POWs in the sample appears to be no greater than in the general population.

Table 1 also shows comparative data on lifetime prevalence rates of psychiatric diagnoses among POWs and samples of men in the general population. Most notable are POWs' elevated lifetime prevalence rates for major or minor depression and PTSD. Lifetime prevalence of major or minor depression was 23.3 percent among POWs, compared with 16.5 percent in a sample of the general population surveyed using the SADS-L (29). Bipolar I and II disorders occurred with about equal frequency in the POW and community samples.

NIMH's Epidemiologic Catchment Area surveys (20,30), which used the Diagnostic Interview Schedule (31), provided a basis for estimating comparison figures for alcohol abuse or dependence, schizophrenia, and PTSD. The lifetime rate for alcohol abuse or dependence was not elevated among the POWs. The rate of schizophrenia was slightly elevated. The PTSD prevalence rate among POWs was 70.9 percent, far higher than the frequency of that disorder in the general population. However, the rates of schizophrenic disorder and PTSD in the general population were based on samples with a wider age range than the POW sample. The low incidence of these disorders in the general population and the lack of age-specific rates precluded estimates more closely matched to the sample.

Table 2 presents data on physical and psychiatric disorders among POWs who were held in Europe, the

Table 2
Lifetime prevalence rates of somatic and psychiatric disorders among prisoners of war (POWs) in World War II and the Korean War, in percentages, by site of captivity

Disorder	Europe (N=343)	Pacific (N=65)	Korea (N=18)
Somatic conditions			
Hypertension	39	42	39
Cerebrovascular accident	1	0	0
Myocardial infarction	21	19	22
Intermittent claudication	2	3	0
Dysentery[1]	3	20	11
Malaria[2]	3	54	11
Beriberi[3]	<1	48	17
Frozen feet	17	5	11
Psychiatric conditions			
Major or minor depression	22	31	28
Bipolar I or bipolar II disorder	<1	3	0
Alcoholism	22	22	11
Schizophrenia	2	3	6
Posttraumatic stress disorder[4]	70	79	53
Generalized anxiety disorder	47	58	44

[1] $\chi^2=25.79$, df=2, $p<.001$
[2] $\chi^2=136.08$, df=2, $p<.001$
[3] $\chi^2=164.59$, df=2, $p<.001$
[4] $\chi^2=11.81$, df=2, $p<.01$

Pacific theater, and Korea. It also introduces data on the frequency of generalized anxiety disorder and of physical conditions such as beriberi and frozen feet that are specifically related to the POW experience. The subjects experienced significant malnutrition as POWs; the sample lost a mean±SD of 29±13.7 percent of their normal weight during captivity. POWs who were held in the Pacific theater lost significantly more weight, an average of 39 percent of their body weight, compared with POWs held in Europe or Korea (27 percent and 29 percent, respectively) ($F=30.06$, one-way ANOVA, $df= 2,358$, $p<.01$).

The prevalence of health residuals such as beriberi and frozen feet was higher among POWs than in the general population. Histories of malaria were found in 11.4 percent of the sample, dysentery in 6.3 percent, beriberi in 8.1 percent, and frozen feet in 14.7 percent. The first three conditions were especially common among POWs held in the Pacific theater, less common among POWs held in Korea, and uncommon among POWs held in the European theater. Frozen feet were more frequent among POWs who were held in Europe and Korea.

The sample's overall rate of generalized anxiety disorder was high. Although data on the frequency of generalized anxiety disorder in the general population are not available, the rate is likely to range from 3 to 6 percent (32). The lifetime rate of generalized anxiety disorder was higher among POWs held in the Pacific theater than among those held in Europe and Korea, although not significantly higher. In addition, PTSD occurred in 79 percent of the POWs who served in the Pacific theater. However, the results do not support the hypothesis that POWs held in the Pacific theater and in Korea have higher rates of depressive, posttraumatic stress, and generalized anxiety disorders. This finding may be due to the small number of POWs in the sample who were held in those sites (65 and 18, respectively).

Although a prevalence rate for peptic ulcers in the general population could not be identified, this disorder was noted in 16 percent of the POWs in the sample. It also occurred in excess among Australian POWs of the Japanese (33). Current sleep disturbances (not shown in the tables) were frequent in this sample, as in other samples of POWs (34); 28 percent of our sample reported fitful, disturbed sleep and not feeling rested most mornings. Repetitive nightmares were reported by 36 percent, and 24 percent reported nightmares every few nights.

Table 3
Lifetime prevalence rates of somatic and psychiatric disorders among prisoners of war (POWs), in percentages, grouped by percent of body weight loss during captivity

Disorder	Body weight loss	
	35 percent or less (N=242)	More than 35 percent (N=120)
Somatic conditions		
Hypertension	41.7	35.8
Diabetes mellitus	9.1	7.5
Cerebrovascular accident	.4	.8
Myocardial infarction	22.7	20.0
Intermittent claudication	2.1	2.5
Peptic ulcer	17.8	14.2
Psychiatric conditions		
Major or minor depression[1]	21.1	31.7
Bipolar I or bipolar II disorder	.8	.8
Alcoholism	21.4	18.3
Schizophrenia[2]	.4	4.2
Posttraumatic stress disorder[3]	66.5	79.4
Generalized anxiety disorder[4]	45.5	56.7

[1] $\chi^2=4.85$, $df=1$, $p<.05$
[2] $\chi^2=6.93$, $df=1$, $p<.01$
[3] $\chi^2=5.23$, $df=1$, $p<.05$
[4] $\chi^2=4.04$, $df=1$, $p<.05$

Weight lost during captivity is a good marker of the severity of the trauma associated with captivity and a strong predictor of later disability (5,9). For example, morbidity and mortality rates increased rapidly among concentration camp survivors who experienced more than a 35 percent weight loss (35). We divided the sample into two groups based on the percentage of body weight lost during captivity to observe the relationship of this variable to POWs' health status after repatriation. Table 3 shows the results of this analysis.

Of the 362 POWs for whom complete data on medical conditions and weight loss were available, those who lost more than 35 percent of their body weight had higher rates of anxiety disorders, depressive disorders, PTSD, and schizophrenia. However, their rates of the six reported physical conditions were not significantly higher than those of POWs who lost less weight. Five POWs who lost more than 35 percent of their body weight developed schizophrenia at some point following repatriation, compared with only one POW whose weight loss was less than 35 percent.

Discussion

Our finding of a relatively low rate of somatic disorders among POWs supports Keehn's (9) finding of no "increased aging" among former POWs. Cerebrovascular accident and myocardial infarction appeared less frequently in our POW sample than in the general population. True prevalence rates of these and other disorders may be underestimated in our study because affected POWs might be less likely to present themselves for examination. However, the rates for physical illness overall are somewhat lower in our sample than in the general population, suggest-

ing that POWs who survive their captivity and live long enough to be examined constitute a biased sample that is more likely to include healthy subjects.

The observed PTSD lifetime prevalence of 70.9 percent and the current prevalence rate of 34.5 percent among POWs are high even in comparison with lifetime and current rates of 30.9 percent and 15.2 percent among Vietnam veterans (17). The ratios of current to lifetime rates in both groups (nearly 50 percent) clearly show that PTSD is a chronic disorder for many former POWs. Our sample's current PTSD rate is comparable only to the 35.8 percent rate found among Vietnam veterans exposed to heavy combat (17).

The current rate of PTSD among POWs who lost more than 35 percent of their weight in captivity is higher still, at 45.8 percent. While exposure to the stressors of a war zone exerts long-term influences similar to those observed among POWs (who themselves usually experienced combat trauma before capture), severe stress experienced as a POW appears to produce sequelae of greater intensity and duration (7). Service during wartime in itself does not increase the risk of psychiatric sequelae (36). Several more cases of schizophrenia occurred among POWs who lost higher proportions of weight during captivity, suggesting that severe maltreatment raises the risk of onset of this disorder.

The findings suggest several implications for assessment and treatment. For the somatic conditions considered, POWs' general health status is comparable to that of males of similar age. Still, they often have special health problems due to maltreatment during their captivity. The VA presumes the following disorders are connected to a POW's captivity experience: traumatic arthritis, residuals of frostbite, peptic ulcer disease, peripheral neuropathy, irritable bowel syndrome, chronic dysentery, helminthiasis, and diseases of nutritional deficiency, in addition to psychoses and the anxiety, depressive, and posttraumatic stress disorders noted earlier.

The psychiatric disorders exact a heavy toll in psychosocial functioning, yet are often unrecognized by clinicians. Recognition is crucial, as proper treatment may ameliorate many of the symptoms (24). Kolb (37) suggested two factors that may hinder recognition. First, health care educators have focused on posttraumatic disorders only when awareness of the condition has been forced on them during wartime or after a disaster. Second, most POWs avoid discussion of their traumatic experiences. They are unlikely to complain of ongoing and potentially treatable psychiatric problems; they often lack a "complainant set" (15), accept their disabilities, and do not perceive links between their current distress and their POW experiences. Clinicians should remain alert for symptoms of depressive and anxiety disorders, especially among POWs with unexplained somatic complaints or chronic sleep disturbances.

Discussion of traumatic events can elicit clinical information that is relevant from both the somatic and the psychosocial perspective (38). For POWs, questions about the severity of the captivity experience, particularly about weight loss, injuries, and illnesses, should help guide medical evaluations and suggest various diagnostic and treatment possibilities. Monitoring for long-term effects of malnutrition may be indicated. Worsening of PTSD symptoms when age weakens previously adequate defenses is observed among older POWs and combat veterans (24,39). Nonetheless, even severe PTSD symptoms and multiple medical problems often respond well to multidisciplinary treatment.

Individuals who have suffered from an anxiety disorder such as PTSD for many years may succumb to an exhausted depressive state. These depressions are not particularly responsive to electroconvulsive therapy or tricyclic antidepressants; monoamine oxidase inhibitors may be a preferred treatment (40). Nonetheless, tricyclics improved most sleep parameters for a group of 11 POWs (41), although several patients preferred their sleep disturbance over the medication. Taking medication may sometimes be unacceptable to POWs because of side effects, but more often it may threaten their sense of control, especially for those who do not acknowledge the psychiatric nature of their symptoms. Posttraumatic disorders are part of the spectrum of human response to trauma, and approaches to their treatment continue to be refined (26,38–42).

Conclusions

Our findings are consistent with Beebe's (11) explanatory model involving two types of injury: one is somatic and primarily short-term; the other is psychological and essentially permanent. These injuries lead to a loss of ego strength and lowered thresholds for both physical and psychological distress. Our findings parallel recent reviews of the effects of torture (43) and of war and other traumatic events (44), which conclude that traumatic experiences often precipitate psychiatric symptoms and that these sequelae are more prevalent than previously appreciated. We believe that POWs and other victims of maltreatment in captivity, such as hostages of terrorists and concentration camp survivors, may be likely to show such symptoms (21).

We also note that following repatriation, the vast majority of POWs secured employment, married, and raised families despite persisting anxiety and depressive symptoms. Furthermore, a remarkable number adjusted well. Many POWs used their ordeal as an springboard toward greater psychological health (45). Further study of the positive aspects of POWs' adjustment should increase our understanding of human coping and resilience.

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