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**The Long-Term Psychiatric Sequelae of the Prisoner of War Experience:
Findings From Operation Homecoming Vietnam Veterans**

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Summary

Background

Most empirical research indicates that the psychological impact of trauma suffered by war captives is severe and persistent. A few studies, however, have found little psychological disorder or minimal sustained psychiatric effects of captivity among repatriated prisoners of war (RPOWs). This suggests the presence of protective factors and the need for controlled, longitudinal, epidemiological investigations of the long-term psychiatric sequelae of the POW experience.

Objective

The overall objectives of the present study were to (1) determine the lifetime and current prevalence of psychiatric disorders among Vietnam RPOWs and matched controls 25 years postrepatriation, and (2) to identify risk and protective factors for key psychological outcomes. Possible risk and protective factors included physical health status, personality factors, social support and lifestyle factors, medical service utilization including number of completed medical examinations, and family health status.

Method

A brief questionnaire mailed in 2000 to 260 of the original 566 Vietnam RPOWs and 81 of the original 138 Navy Vietnam veteran controls from Operation Homecoming obtained baseline veteran and family health risk factor and psychological status screening information. Computer-based telephone interviews in 2001 using the Quick Diagnostic Interview Schedule provided clinically based lifetime and recent diagnoses. Hence, the present study assessed psychiatric disorders in this RPOW population based on self-reported measures of psychiatric morbidity from standardized screening instruments and a clinically based diagnostic instrument.

Results

Questionnaire results of 44 matched pairs showed that RPOWs were significantly more likely than controls to be limited in activities because of physical, mental, or emotional problems, and to perceive their health as poorer. Previous findings of higher rates of arthritis and back/neck problems replicated. RPOWs scored more negatively on Duke Health Profile subscores of depression and anxiety, but they did not differ from controls on alcohol abuse/dependence or geriatric depression screening measures. Though diagnostic interview results of 41 matched pairs suggest RPOWs may be at greater risk for depression and posttraumatic stress disorder, insufficient cell count accompanied these associations, obscuring interpretation. No significant predictors of psychiatric disorder were identified.

Conclusions

Current physical health status appeared to be more related to the psychiatric status of naval aviator Vietnam veterans than the POW experience itself. Strengths of the current study over previous studies are the use of controls, longitudinal analyses, and a longer time frame for follow-up.

Introduction

Prisoner of war (POW) captivity can involve the most extreme trauma perpetrated by humans.¹⁻³ Not surprisingly, most empirical research indicates that the psychological impact of trauma suffered by war captives is severe and persistent.³⁻¹⁰ A few studies, however, have found little psychological disorder or minimal sustained psychiatric effects of captivity among repatriated prisoners of war (RPOWs).¹⁰⁻¹⁴ This suggests the presence of protective factors and the need for controlled, longitudinal, epidemiological investigations of the long-term psychiatric sequelae of the POW experience. The understanding of both protective and risk factors is critical to identifying the screening and training criteria needed to reduce the risk of negative psychiatric consequences of captivity.

The present study assessed psychiatric disorders in a Vietnam War RPOW population based on self-reported measures of psychiatric morbidity from standardized screening instruments and a clinically based diagnostic instrument. The overall objectives of the present study were to (1) determine the lifetime and current prevalence of psychiatric disorders among Vietnam RPOWs and matched controls 25 years postrepatriation, and (2) to identify risk and protective factors for key psychological outcomes. Possible risk and protective factors included physical health status, personality factors, social support and lifestyle factors, medical service utilization including number of completed medical examinations, and family health status.

Several studies suggest that the older, more educated, married, less-combat-experienced captives who received postrelease social support fared better than their counterparts.^{1,3,8,10,15-17} Because related factors such as employment and higher socioeconomic status may be protective against depression among former POWs,¹⁵ the present study also evaluated the hypothesis that previously asymptomatic RPOWs may begin to experience delayed onset of mental health problems with retirement, the loss of social supports associated with regular employment, and the loss of friends and family associated with aging.

Another possible social support effect is related to the postrelease examination process itself. Similar to the Hawthorne effect in which employees have been found to respond positively by virtue of receiving special attention from their employers (by enlisting them in an experimental situation),¹⁸ it is possible that RPOWs receiving attention through the government-supported medical examination program are responding with less mental distress or disorder. No other studies have been found that assessed the possible contribution of examination effects to perceived or physician-assessed health. Therefore, the present study also evaluated the hypothesis that, in comparison with control subjects, the RPOWs with more medical examination visits would have better mental health than those with fewer visits.

Method

Study Population

The Operation Homecoming population consists of 566 Vietnam RPOWs from all US service branches and 138 Navy Vietnam veteran controls. Controls were selected in 1976 from squadrons from which the Navy RPOW was imprisoned and one-to-one matched on 9 variables: age \pm 1 year, commissioning year \pm 2 years, job designator (pilot or bombardier/navigator), educational level (service academy/university or other), marital status, rank, total number of

flight hours, type of aircraft flown at the time of casualty, and casualty date \pm 17 months (matched to date that the control group member was flying combat missions over North Vietnam). Further details on the selection procedures, participation rates, and comparisons of the controls with the RPOWs are described in Spaulding et al.¹⁹

This study utilized an expanded version of the Operation Homecoming database from the Naval Operational Medicine Institute (NOMI), Pensacola, Florida, that was used in a previous study in which unexpectedly low rates of mental disorder were found.¹¹ This expanded database included an additional 7 years of follow-up examinations of naval aviators and controls, as well as the original examination data from the RPOWs in all other services. Most analyses in this study, however, were limited to the subset of Navy matched pairs. Specifically, this study sample consisted of Navy POWs repatriated from North Vietnam and returned to the United States during the period February through April 1973 and who received at least one annual physical examination at NOMI between 1977 and 1979, inclusive. It also included Navy Vietnam-veteran controls who also received their first annual NOMI physical examinations between 1977 and 1979. The period 1977–1979 was chosen to maximize inclusion of controls; controls had their first NOMI annual examinations from 1976 through 1978.

Measures and Procedures

A 4-page Vietnam Veteran Medical History questionnaire was designed and mailed in 2000 with cover letter, consent form, request for telephone interview, and certificate of participation to all RPOWs and controls in the study. Questionnaire items addressed demographic information, medical history, general physical and mental health status, job and marital status, lifestyle factors including smoking and alcohol use, medical and psychological service utilization, and family health status. Outcome variables based on standardized measures were:

Duke Health Profile (DUKE): DUKE is a 17-item generic instrument that measures self-reported health and dysfunction during a 1-week time period. Six health scales measure physical, mental, social, general (physical, mental, and social), perceived health, and self-esteem. Five dysfunction scales measure anxiety, depression, a combined measure of anxiety and depression, pain, and disability. This instrument has been shown to have good clinical validity and reliability.²⁰ Standard scoring procedures were used to calculate scale scores in which a score of 100 indicated the best health status, and 0 the worst health status, on the health scales. By contrast, a score of 100 indicated the worst health status, and 0 the best health status, on the dysfunction scales. In the present study, inter-item Cronbach's alpha coefficients were 0.77 on the physical health scale, 0.71 on the mental health scale, 0.65 on the social health scale, 0.64 on the self-esteem scale, 0.66 on the anxiety scale, 0.66 on the depression scale, and 0.74 on the combined anxiety-depression scale. The 7-item combined anxiety-depression scale, also referred to as DUKE-AD, has been used in primary care as a screening tool for anxiety and depression. A score over 30, which indicates anxiety and/or depression, was used as the standard cutoff in the present study.²¹

Geriatric Depression Scale (GDS): The 5-item version of GDS was designed to screen for depression in a community-dwelling older population. It has been shown to be as effective as the 15-item GDS for depression screening in an outpatient population²² and is scored from 0 through

5 on the basis of yes/no responses. A score of 2 or higher indicates possible depression.²² This scale was found to have a very low reliability coefficient ($\alpha = 0.27$) in the present sample. With one item ("Are you basically satisfied with your life?") excluded, however, the alpha coefficient increased to .51.

Two-Item Conjoint Screening Test for Alcohol Problems (TICS): Two questionnaire items were used to screen for alcohol problems within the last year. TICS has been shown to discriminate current substance use disorders with 81% sensitivity and identical specificity.²³ A negative response to both items is classified as low risk, a positive response to either item is classified as medium risk, and two positive responses are classified as high risk. The inter-item alpha coefficient was 0.62 in the present study.

Short posttraumatic stress disorder (PTSD) screen: To screen for lifetime and current (past month) PTSD, a short screening scale for *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV) PTSD²⁴ was modified to acknowledge the fact that all participants had experienced the war in Vietnam. The phrase "After Vietnam" was added to the beginning of each of the 7 self-reported yes/no response items. The alpha coefficient in the present study was 0.75. An eighth item inquired whether the respondent had any of the preceding problems or feelings in the last month. A score of 4 (based on first 7 symptom items) was used as the cutoff for indicating respondents with and without PTSD.²⁴

Other outcome variables were the DSM, Third Edition, Revised (DSM-III-R) criteria-based diagnoses obtained from telephone interviews using the Quick Diagnostic Interview Schedule (QDIS).²⁵ QDIS is a shortened, computerized version of the National Institutes of Mental Health Diagnostic Interview Schedule used previously in the Epidemiologic Catchment Area (ECA) studies^{26,27} and in previous studies of active-duty naval personnel.²⁸ Both versions have been found to have good reliability for most diagnoses.^{28,29} QDIS asks the minimum number of questions needed to make a diagnostic decision for the selected lifetime and active (within the last year) diagnoses of interest in this study, including major depressive episode, generalized anxiety disorder, panic disorder, agoraphobia, social phobia, simple phobia, PTSD, obsessive-compulsive disorder, and alcohol abuse or dependence. A telephone interviewer manual was developed to provide standardized data collection procedures. Three master's degree- or doctorate-level interviewers were trained to administer all interviews. Further details on the telephone interview procedures can be found elsewhere.²⁸

Potential protective and risk variables: *POW experience* variables included location and year of captivity, captivity time, time in solitary confinement, time in irons, time in cuffs, and summary score from torture questionnaire. These were obtained from electronic records of the initial repatriation interview in 1973. Perceived treatment compared with other POWs (worse, about the same, better) was also obtained from a single item on the 20-year follow-up current questionnaire, as were the remaining variables. *Family health and disability history* was assessed by 3 items. One item inquired if the respondent or any of his blood relatives ever had diabetes, cancer, high blood pressure, heart disease, or an emotional or substance abuse problem. Two items taken from the National Household Interview Survey³⁰ inquired whether the respondent or anyone else living in his home needed assistance with personal care, or was limited in activities because of physical, mental, or emotional problems. *Lifestyle* variables included current smoking

and duration, current alcohol use and amount, number of regular exercise hours, perceived general health rating, and membership in a church or synagogue. *Medical status* was assessed with a checklist of 37 potential medical conditions in the past year (treated or not). Respondents were also asked if they were currently under a doctor's care and for what problems, their surgeries/hospitalizations in past 5 years, their regular prescriptions and over-the-counter medication, their usual health care provider, whether they had ever used unconventional or alternative methods of treating their health problems, and their health insurance coverage. To assess *dispositional resilience*, the control factor items of the modified Personality Hardiness Scale³¹ were included as a measure of one's sense of autonomy and ability to influence one's own destiny. These 10 items are scored on a 0 through 3 response scale, with 0 indicating not at all true and 3 indicating completely true. The interitem coefficient was unacceptably low in the present study ($\alpha = 0.22$). Because no associations between cases and controls were obtained with the summary score variable, it was dropped from further analyses.

Statistical Analyses

Lifetime and current prevalence estimates of psychiatric disorder were obtained from telephone interview diagnoses. Paired-sample *t* tests for 1:1 matched pairs, chi-square tests of association, and odds ratios were used to examine differences between RPOWs and controls on POW exposure, health, psychosocial, and demographic variables obtained from the medical examination files and the questionnaire. Due to the matched samples, multivariate logistic regression without the constant was used to examine the relative importance of predictor variables for key psychiatric outcomes.

Results

A total of 260 RPOWs to whom questionnaires were sent and 81 of the Navy Vietnam veteran controls had deliverable addresses. Of these, 204 RPOWs and 66 Navy controls returned completed questionnaires for a response rate of 79% among those with deliverable addresses. Among respondents, 44 matched pairs were identified for analysis. Power to detect medium effect sizes was estimated at 0.77.³² A total of 241 psychiatric telephone interviews of respondents were completed, including 41 of the 44 Navy RPOW and control matched pairs. Eighteen interview subjects were unavailable or could not be contacted after 6 attempts, 1 was too hard of hearing to complete the interview, 1 was too ill, and 2 had changed their minds about participating. The average completion time for the interview was 27 minutes. Interviewers evaluated the quality of each interview on rating forms adapted from the Assessment of Occupational Functioning.³³ Interviewers reported that 96% of the interviewees had heard and understood all questions. Only one interviewee demonstrated some difficulty expressing ideas and thoughts. Two interviewees were referred to the Veterans Hotline or their physician after the interview due to their recent onset of unreported symptoms.

Navy RPOWs and controls served an average of 28 years in the military and were seen for annual examinations an average of 16 times during the 23-year span of this study. The average length of captivity for the RPOWs was 63 months, during which they had spent an average of 45 weeks in solitary confinement. The average age of the 44 matched pairs of RPOWs and controls at the time of this study was 65 years. All were Navy officers (69% were captains or above, including 7 admirals), 97% had college degrees, 80% had been pilots, 53% were still working for pay at least part-time or doing volunteer work, 91% were married, and 100% were Caucasian.

Table 1 shows the psychological screening results for cases and controls. There was no significant difference between RPOWs and controls on screening instruments for lifetime and current PTSD, geriatric depression, or alcohol problems. As can be seen in Table 2, RPOWs had higher (poorer) scores on the individual DUKE anxiety and depression subscales and scored more poorly on the DUKE general and physical health measures.

Table 1. Psychological Screening Test Results in 44 Matched Pairs (N = 88) of Navy Repatriated Prisoners of War (RPOWs) and Controls, 2000

Psychological Screening Test	RPOWs		Controls		Odds Ratio	95% CI*
	n	%	n	%		
Duke Anxiety-Depression Scale (>30)	6	14	1	2	7.2	0.8-62.3
Geriatric Depression Scale (4-item), possibly depressed	5	11	2	5	2.6	0.5-14.3
Two-Item Conjoint Screening for Alcohol Problems, medium-high risk	29	67	24	54	1.7	0.7-4.1
Short Posttraumatic Stress Disorder (PTSD) Screen, lifetime diagnosis	3	7	0	0
Short PTSD Screen, current diagnosis	3	7	0	0

*CI, confidence interval.

Table 2. Duke Health Profile Subscale Scores in Matched Pairs (N = 44) Analysis of Repatriated Prisoners of War (RPOWs) and Controls, 2000

Subscale	RPOWs		Controls		t (2-tailed)	P
	Mean	SD	Mean	SD		
Anxiety	16.7	15.2	10.5	11.2	2.4	0.02
Depression	15.7	17.4	9.8	11.8	2.1	0.04
Anxiety-Depression	14.3	15.9	9.2	11.5	1.9	0.07
Physical Health	68.5	20.8	77.8	18.9	2.3	0.03
General Health	78.0	13.5	84.8	10.6	2.8	0.01
Mental Health	90.2	16.1	94.4	11.6	1.3	0.18
Social Health	76.7	17.1	82.1	15.2	1.5	0.13
Perceived Health	78.6	25.0	88.1	24.2	1.7	0.10
Self-esteem	86.0	16.3	91.4	14.2	1.6	0.12
Pain	52.3	28.4	39.8	31.6	1.8	0.09
Disability	4.5	21.1	3.4	16.7	0.3	0.78

Table 3 shows the health conditions that significantly differentiated the present health status of RPOWs and controls. RPOWs perceived their health as poorer, were more likely to be limited in their daily activities due to health problems, and were more likely to have had an emotional or substance abuse problem or a relative with one. RPOWs were also more likely to have had arthritis/gout and back/neck problems. No significant differences were found between RPOWs and controls on lifestyle variables, such as smoking, alcohol use, or exercise, or on church/synagogue membership, current level of work or retirement, or number of annual examinations received.

Table 3. Risk Factors in 44 Matched Pairs of Navy Repatriated Prisoners of War (RPOWs) and Controls, 2000

Risk Factor	RPOWs		Controls		Odds	
	n	%	n	%	Ratio	95% CI*
Self or relative ever had emotional or substance abuse problem	13	30	2	5	8.4	1.8-40.3
Limited in activities	14	33	2	4	10.1	2.1-48.0
Perceived health less than excellent	32	74	21	49	3.0	1.2-7.6
Arthritis/gout in past year	23	53	10	23	3.8	1.5-9.6
Back/neck problems in past year	18	42	8	19	3.1	1.2-8.4

*CI, confidence interval.

Table 4 shows the prevalence of lifetime and current (1 year) psychiatric diagnoses among RPOWs and controls. Almost one third of the RPOWs had at least one of the psychiatric diagnoses measured in this study during their lifetime, and 10% had a current or recent diagnosis, indicating a remission rate of 66%. The most prevalent lifetime diagnosis was alcohol abuse/dependence among both RPOW and control subjects (17% and 15%, respectively). While no other psychiatric disorders were diagnosed among controls, RPOWs had a lifetime prevalence rate of 15% for depression and 10% for PTSD. Three of the four RPOWs with a lifetime diagnosis of PTSD also had the diagnosis within the past year. Only 5% of the RPOWs met criteria for major depression within the previous year.

Table 4. Prevalence of Quick Diagnostic Interview Schedule Lifetime and Current (1 Year) Psychiatric Diagnoses Among 41 Matched Navy Repatriated Prisoners of War (RPOWs) and Control Pairs With Telephone Interviews, 2001

Psychiatric Diagnosis	RPOWs		Controls	
	n	%	n	%
Lifetime				
Any lifetime diagnosis	12	29	6	15
Alcohol abuse/dependence	7	17	6	15
Posttraumatic stress disorder (PTSD)	4	10	0	0
Depression	6	15	0	0
Mania	1	2	0	0
Generalized anxiety disorder	1	2	0	0
Panic disorder	1	2	0	0
Social phobia	1	2	0	0
Current				
Any current diagnosis	4	10	0	0
PTSD	3	7	0	0
Depression	2	5	0	0

To identify potential predictors and protective factors of psychiatric morbidity, bivariate relationships between demographic, lifestyle, physical health, and POW experience variables and any lifetime QDIS psychiatric disorder were examined. Only lower education level (as master's degree or higher versus less than master's degree; $\chi^2 = 6.0$, $df = 1$, $P = 0.014$), poorer general health (DUKE subscale score) ($t = 2.1$, $df = 77$, $P = 0.036$ 2-tailed, 95% confidence interval, 0.5-13.4), and cancer occurrence for subject or a blood relative ($\chi^2 = 8.7$, $df = 1$, $P = 0.003$) were significantly associated with any lifetime psychiatric disorder. None of the torture-related variables were significantly related to psychiatric disorders.

Discussion

The present study evaluated self-reported measures of psychiatric morbidity 25 years after release from captivity during the Vietnam War. On the whole, very little psychiatric morbidity was found in this Vietnam veteran cohort of mostly well-educated, married, former naval aviator RPOWs. Only one third of the RPOWs had ever had a psychiatric diagnosis, and only 10% were identified as having a recent or current one. Because of the high levels of screening, training, motivation, and maturity of this particular cohort relative to that of other military POW populations studied, it is likely that the population in this study represents one of the military's lower risk groups, and that psychiatric morbidity rates would be lower than those for younger, less prepared personnel. The 10% lifetime prevalence of PTSD among RPOWs obtained using QDIS was higher than rates for men ages 45 through 54 years in the general population using the Diagnostic Interview Schedule and related Composite International Diagnostic Interview,^{34,35} but

lower than the 20% obtained for wounded Vietnam veterans in the ECA survey.³⁴ It may also be compared with the 6.2% conditional probability of PTSD in a community sample of men after exposure to a traumatic event.³⁶ While lifetime prevalence rates for alcohol abuse/dependence, panic disorder, and phobias were similar to those for white men in the general population,^{37,38} the RPOWs tended to have somewhat higher rates for affective disorders than those observed in the ECA survey (e.g., 11% vs. 5%, respectively).³⁹ These higher rates vary from previous reports of Navy and Air Force aviator Vietnam POWs,^{11,40} however methodological differences between studies make comparisons difficult.

In terms of identifying risk and protective factors for psychiatric morbidity, few variables, including those related to torture experiences, significantly differentiated veterans with and without psychiatric disorder. Contrary to several studies of World War II and Korean POWs^{10,41,44-46} in which severity of treatment was predictive of PTSD, no association was found in the present study. This may be due, in part, to the small number of PTSD diagnoses. Also, although a previous study of Air Force Vietnam POWs identified psychiatric morbidity differences between pre-1969 and post-1969 capture periods on the basis of harsher treatment received pre-1969,⁴⁰ only 6 of the RPOWs in the present study were captured post-1969 and half (3) had at least one QDIS psychiatric diagnosis.

RPOWs were significantly more likely than controls to be limited in activities because of physical, mental, or emotional problems and to perceive their health as poorer. Higher rates of arthritis and back/neck problems reported at 20 years' postrepatriation¹¹ continued to be observed 27 years after repatriation. Overall poorer physical health appeared more related to the long-term psychiatric status of Vietnam veterans than the POW experience itself.

In terms of specific hypothesis testing, some evidence from the longitudinal and multivariate analyses indicated that RPOWs may become more vulnerable to psychiatric problems as they age, especially those with physical health problems. This is consistent with previous literature that suggests delayed onset may be evident in the development of postcaptivity psychiatric morbidity.^{40,41} Because the number of medical examinations received in the study period was not associated with either POW status or any lifetime psychiatric diagnosis, no evidence was found to support the hypothesis of a possible Hawthorne or social support effect of the volunteer postrelease annual examination process.

Consistent with the nature of the brief questionnaire screening instruments and expectations that self-reported symptom measures would tend to define and yield more psychiatric disorder, DUKE-AD, GDS, and TICS identified a broader range of anxiety, depressive, and alcohol abuse cases than the clinically based measures. Only the DUKE subscales for anxiety and depression significantly differentiated RPOWs from their matched controls. While Navy RPOWs scored more negatively on Duke Health Profile subscores of depression and anxiety, they did not differ on alcohol abuse/dependence, geriatric depression, or PTSD screening instruments. Also, no significant differences between RPOWs and controls were found in lifetime or current prevalence rates of any disorder measured with QDIS.

Physical health status and education level appeared more related to the psychiatric status of naval aviator Vietnam veterans than the POW experience itself. Strengths of the current study

over previous studies are the use of controls, longitudinal analyses, and a longer time frame for follow-up. Future research will benefit from focus on the performance of clinical criteria-based standardized instruments in larger population groups.

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13. SUPPLEMENTARY NOTES

14. ABSTRACT (maximum 200 words) The purpose of this study was to determine the psychiatric status and risk profile of repatriated prisoners of war (RPOWs) 25 years after their return. Subjects were 260 of the original 566 Vietnam War RPOWs and 81 of the original 138 Navy Vietnam veteran controls from Operation Homecoming. Methods included a brief questionnaire in 2000 to obtain baseline veteran and family health risk factor and psychological status screening information. Additionally, computer-based telephone interviews in 2001 using the Quick Diagnostic Interview Schedule provided clinically based lifetime and recent diagnoses. Results among 44 matched pairs showed RPOWs significantly more likely than controls to be limited in activities, perceive their health as poorer, experience higher rates of arthritis and back/neck problems, and score more negatively on Duke Health Profile measures of depression and anxiety. Current physical health status appeared to be more related to the psychiatric status of naval aviator Vietnam veterans than the POW experience itself. Strengths of the current study over previous studies are the use of controls, longitudinal analyses, and a longer time frame for follow-up.
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15. SUBJECT TERMS prisoners of war, Vietnam, posttraumatic stress disorder, stress(psychology), mental health, interviewing, questionnaires

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