NAVAL HEALTH RESEARCH CENTER

THE MENTAL STATUS OF WOMEN IN THE NAVY AND MARINE CORPS: PRELIMINARY FINDINGS FROM THE 1995 PERCEPTIONS OF WELLNESS AND READINESS ASSESSMENT

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The Mental Health Status of Women in the Navy and Marine Corps: Preliminary

Findings from the 1995 Perceptions of Wellness and Readiness Assessment

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ABSTRACT

Background: Data are lacking on the health effects of women's exposure to increased combat-related and nontraditional occupational roles in the military. Patterned after the large national health surveys, the 1995 Perceptions of Wellness and Readiness Assessment was designed to provide baseline health and risk factor information on the health and mental health status of women in the US Navy and Marine Corps and to make comparisons both within military subpopulations and with civilian populations.

Methods: A population-based, two-stage, cluster sample of nearly 10,000 active-duty Navy and Marine Corps women and men was screened for above-normal levels of psychosocial distress and depressive symptomatology using standard cut-points on 2 psychiatric screening instruments. A clinically based, structured computerized telephone interview was administered to subsamples of both positive- and negative-screening volunteers to make Diagnostic Statistical Manual-III-R psychiatric diagnoses.

Results: Twenty-five percent of all respondents met Diagnostic Statistical Manual-III-R criteria for lifetime nicotine dependence. Estimates were 40% and 21% for overall lifetime and 1-year prevalence of psychiatric disorders, respectively. Higher risks of disorder were associated with being enlisted, ever married, and having no college education. Women had about 5 times the risk of experiencing Posttraumatic Stress Disorder than men and about twice the risk of a major depressive episode. Women generally sought treatment more readily than men.

Conclusions: Similar to findings in the civilian literature, Navy and Marine Corps women may be at higher risk for depression and Posttraumatic Stress Disorder, and men at higher risk for alcohol abuse/dependence.

The health and fitness of naval personnel have long been concerns of those responsible for ensuring troop readiness and effectiveness. The US Navy and Marine Corps have requirements for maintaining acceptable levels of weight, body fat, and physical ability. Likewise, mental health is also important for maintaining the functioning of military personnel, yet it receives far less attention. Because disorders such as Posttraumatic Stress Disorder (PTSD), depression, and anxiety can be severe enough to affect performance in the general population, it is especially important that such disorders be examined in the military population, which is tasked with the nation's defense.

Mental disorders are the second leading cause for hospitalization among enlisted men (after injuries) and enlisted women (after pregnancy-related conditions) in the Navy[1] and the fifth leading cause of medical evacuation from Navy ships at sea.[2] While psychiatric incidence rates are high for both sexes, some studies have suggested that women may have much higher rates than men.[3] For example, a study of sex differences in sick-call diagnoses aboard US Navy ships found significantly higher rates of personality disorder, stress, adjustment reactions, and other symptoms/syndromes (e.g., eating and sleep disorders) among women.[4] Two-fold to four-fold differences in psychiatric hospitalization rates (excluding alcoholism) were found for women in earlier cohort studies.[1,5] Also, female soldiers deployed during the Persian Gulf War were almost twice as likely as men to be diagnosed with psychiatric disorders.[6] Some investigators have suggested that women are at higher risk for disorder because women find military life more difficult and stressful than do men. Others have suggested that higher rates reflect women's greater propensity to use health services. In view of the

increased proportion of women in the military and their greater exposure to stressful situations, such as nontraditional occupations, deployment, and combat, that may increase the risk of mental distress or disorder, the military should be prepared to plan for the delivery of increased mental health services and must identify and target high-risk groups for mental health promotion efforts.

Posttraumatic Stress Disorder is usually considered a disorder related to the trauma of combat experience. A national survey, however, revealed that in the US general population the lifetime prevalence of PTSD was 7.8%, with women being significantly more likely to have suffered from PTSD than men.[7] In studies examining the most common traumas experienced, results vary; however, events such as childhood abuse, molestation, rape, and witnessing trauma are common qualifying traumas.[7,8] Research has also indicated that a high number of people with PTSD also have other psychological disturbances, such as depression, anxiety disorders, or eating disorders.[7,9] With such prevalence in the general population, it seems likely that similar patterns are present in military populations. Military personnel may fear that seeking psychological help could adversely impact their career, making them less likely to seek counseling after experiencing a trauma. This could increase PTSD prevalence in the military.

Depression, a common civilian psychological disorder, can decrease one's level of functioning. The ability to think clearly, make decisions, remember things, concentrate, or function without easy distraction can be impaired, with depression making occupational tasks difficult, if not impossible.[10] The lifetime prevalence rate of a major depressive episode in the general population is approximately 10%-25% for women and 5% to 12% for men.[10] Researchers have estimated that more than 172 million days of work are lost

annually to depression, based upon a 3% to 5% 6-month prevalence rate.[11] Depression

can be reactive, triggered by external events, or endogenous. The lifestyle of military

personnel may make them more likely than the general population to experience

depressive episodes. This, combined with the need for readiness, creates the necessity to

examine the prevalence of depression in military personnel.

Anxiety disorders are characterized by sudden, intense feelings of discomfort,

fright, or panic, accompanied by physiological symptoms, such as difficulty breathing,

pounding heart, and loss of control.[10] Since anxiety disorders involve sensations of fear,

they can inhibit performance. In the general public, the lifetime prevalence for any type

of anxiety disorder is approximately 15%, with phobias being the most common.[12] Leon,

Portera, and Weissman[12] reported some of the consequences of anxiety disorders, such as

increased rates of alcohol and drug dependence, financial dependence, and employment

problems. The effects of these consequences and the factors leading up to problems like

unemployment are costs that would be detrimental to military personnel as well to their

civilian counterparts.

Other disorders that can impact performance ability include eating disorders and

alcohol and tobacco dependence. While these disorders alone can have physiological and

psychological effects, they are also found to have increased comorbidity with some of the

other conditions previously mentioned. Women with alcohol dependence often have

higher rates of depression and anxiety disorders, and men with alcohol dependence have

an increased rate on antisocial personality disorder.[13] The decrease in physiological

conditioning that can result from these disorders is enough of a factor to make them of

particular concern to military readiness; the psychological aspects and risks of

comorbidity merely intensify the need to measure these conditions within the military population.

Although many studies have examined the prevalence of mental disorders among clinical or hospital-based samples of naval personnel,[3,5,14-20] the Department of the Navy has lacked population-based epidemiological and health services data to adequately assess the extent of mental health problems and evaluate the mental health status of men and women in the general active-duty population of the US Navy and Marine Corps. The purpose of the present study was to provide epidemiological data needed to address these issues by determining the prevalence of the most commonly diagnosed mental disorders in naval service women, comparing the distribution of disorders with those of Navy and Marine Corps men and civilian women, and identifying sociodemographically defined subgroups at risk for psychiatric disorder.

Patterned after the large national health surveys, the 1995 Perceptions of Wellness and Readiness (POWR) Assessment was designed to provide baseline health and risk factor information to estimate the prevalence of a wide range of physical and mental health conditions, and to make relevant comparisons both within military subpopulations and between military and civilian populations. The POWR Assessment consisted of three separate, but complementary, components. The first and most comprehensive component was a large-scale survey in which approximately 10 000 active-duty Navy and Marine Corps personnel completed an in-depth self-report questionnaire. The second component consisted of physical measurements taken on a subsample of approximately 1 200 main survey respondents. The third component, with which the present report is concerned, was a telephone interview designed to ascertain the psychiatric status of a sample of

volunteers who had responded to the main survey. The aims of this survey component included obtaining prevalence estimates to provide a baseline for understanding the mixes of disorders present and the extent to which untreated cases exist in the population. In addition to identifying base rates of mental illness, this study was designed to permit the identification of high-risk subgroups within the population, those with unusually high or unusually low rates of illness. Another important aim of this study was to identify diagnostic groups who have been least adequately served, as well as to provide a baseline against which to measure the effectiveness of new treatment and prevention programs.

The present analyses examine the most common adult psychiatric disorders, as a whole, expected to affect this population. Personnel with a psychiatric disorder are defined as personnel with any of the disorders examined in this study, excluding those with nicotine dependence. The following specific research questions are addressed: (1) How do active-duty Navy and Marine Corps personnel who have experienced common psychiatric disorders in their lifetimes and in the current year differ in their sociodemographic backgrounds and in their use of health services? (2) Are women Sailors and Marines more likely to be diagnosed with a psychiatric disorder and to recover from them? (3) Are minority ethnic groups at higher risk of disorder? (4) Which specific disorders are most common in the total population and in particular population groups? (5) What is the comorbidity of psychiatric disorders examined? and (6) For which disorders is treatment most often sought and not sought?

SUBJECTS AND METHODS

Sample

The overall survey sample design was a two-stage probability sample, with installations selected at the first stage and personnel assigned to selected installations chosen at the second stage. In addition, stratification was used to further control the sample distribution with respect to organizational and demographic characteristics, (i.e., branch of service, sex, race, and paygrade). Stratifying by continental United States and outside the continental United States controlled the geographic distribution of the sample.

The total sample size for the POWR questionnaire survey consisted of approximately 25 863 Navy and Marine Corps personnel selected from 45 geographic locations worldwide. This sample size was based on precision requirements used by the National Health and Nutrition Examination Survey, (NHANES), III,[21] the desire to obtain approximately 10% of the women in each service with an equal number of men, response rates based on Navy research experience with similar methodology, and eligibility rates obtained in the1995 Department of Defense Survey of Health-Related Behaviors Among Military Personnel.[22] Further details on the construction of the sampling frame, the stratification, sample allocation procedures, sample weighting, and estimation procedures are available elsewhere.[23] The overall response rate for the questionnaire was 40%.

On a special handout that accompanied the questionnaire, all participants were asked if they would be willing to participate in a confidential telephone interview regarding their health and mental health, and if so, to provide telephone numbers and preferred contact times. The sample (n=3 491, 36%) for the telephone interview component of the survey was selected from those questionnaire respondents who

consented to the telephone interview and provided usable phone numbers. High levels of

psychosocial distress were determined by standardized cutoff scores on self-administered

screening instruments included in the written questionnaire: the Center for Epidemiologic

Studies-Depression Scale [CES-D]),[24] and the short form of the Hopkins Symptom

Checklist, the Hopkins Symptoms Checklist-21,[25] scored at Naval Health Research

Center (NHRC). A third stage, weighted, stratified, sampling frame oversampled 100%

of the respondents who met criteria on the screening instruments. This sampling design

was patterned after the two-stage approach for case identification and diagnosis described

by Shrout et al.[26] Persons of greatest interest for this survey component were those who

were most likely to have selected mental health diagnoses (such as major depression,

generalized anxiety disorder, or alcohol abuse). Sample sizes of those who did not meet

the criteria or who could not be determined were based on an estimated 20% prevalence

rate, 95% accuracy, and a 5% error rate.

Measures

The Quick Diagnostic Interview Schedule (Quick DIS),[27] the psychiatric

diagnostic instrument used in this study, is a shortened, computerized version of the

National Institutes of Mental Health Diagnostic Interview Schedule used previously in the

well-known Epidemiologic Catchment Area studies.[28,29] The Quick DIS asks the

minimum number of questions needed to make a diagnostic decision for selected

Diagnostic Statistical Manual-III-R (DSM-III-R) diagnoses of interest in this study.

These lifetime and active (within the last year) diagnoses were tobacco (nicotine)

addiction, major depressive episode, generalized anxiety disorder, panic disorder,

agoraphobia, social phobia, simple phobia, PTSD, anorexia, bulimia, soma obsessive-

compulsive disorder, antisocial personality disorder, and alcohol abuse or dependence. Diagnoses known to have very low prevalence (somatization, schizophrenia) or legal implications (drug abuse, pathological gambling, transexualism) were omitted. It was designed to be administered by lay interviewers with little or no previous training. The highly structured interview uses a probe format in which the length of the interview depends on responses to key questions. The minimum number of questions per interview was 75, requiring approximately 8 minutes to complete, that is, if the respondent answered negatively to all questions. Although both the traditional interviewer-administered and computer-assisted versions of the DIS have been found to have good validity and reliability,[30,31] the present study includes the first assessment of the reliability of the DIS given by telephone.

The two screening instruments used—the Center for Epidemiologic Studies-Depression and the Hopkins Symptom Checklist-21 are well established and have been used in several population-based or non clinical studies.[23,24] Depressive symptomatology was assessed with the 20-item CES-D. Widely used in community samples, the 4-point scale ranges from "rarely" or "none of the time" (less than 1 day) (0) to "most" or "all of the time" (5-7 days), and it inquires about how often respondents "have felt this way during the past 7 days."[33-36] Items are scored such that the higher the score, the more depressed the response. A score of 15 or greater is considered an indicator of depression in rural samples and 16 in urban samples.[24] The screening cutoff of 16 was considered conservative for this population and chosen to increase predictive validity.

Psychological distress was assessed with the Hopkins-21. This shortened version of the widely used Hopkins Symptom Checklist has a 4-point scale ranging from "not at

all" (0) to "extremely" (3) and, as with the CES-D, inquires how the respondent felt during the past 7 days. The total distress score has been found to have high internal consistency (split-half alpha coefficients of .90 and .89).[32] Items were summed and averaged to obtain total distress scores such that the higher the score, the higher the distress. Normative data on 224 registered nurses found a mean total distress score of 35.56 (SD=8.52).[25] Therefore, a screening cutoff score of 37 was chosen.

Procedures

Pilot testing of the telephone survey was conducted on 8 individuals who responded positively to the written request for volunteers included with their questionnaire during the on-site survey pilot testing. Definitions and instructions pertaining to the conduct of the telephone survey were compiled into a comprehensive staff instruction manual. Interviewer training consisted of lectures, practice and pilot interviews both with and without a supervisor present, and debriefings.

Sampled volunteers were contacted by telephone to schedule their interview. Although 30 interviews were conducted face-to-face on-site following the body measurements survey, most interviews were conducted by telephone in private offices at NHRC. A minimum of 6 attempts to contact a selected individual was made at various times during day and evening hours. Once contact was made, individuals were reminded of their earlier consent to an interview, asked if it was a good time to complete the survey, informed that it would take between 15 and 45 minutes, and had other questions answered, usually pertaining to anonymity and privacy. For example, individuals were assured that no military individual would have access to an individual's interview results nor would any aspect of the interview be made part of his/her Navy record, and that most

of the questions could be answered with a yes or a no. Call-back appointments were made, as needed, and recorded on a separate appointment sheet or call-back log. The average interview length was 26 minutes. Interviewers maintained a written log of attempted contacts and/or completed interviews, and time and length of interview. Interviewers entered questionnaire responses directly into personal computers. A few respondents clearly indicated present and untreated symptomatology. In such cases, interviewers reminded respondents of the problem they had expressed during the interview and advised them to seek help from the resources available on base. Also at the conclusion of the interview, interviewers advised respondents of the possibility of retesting and obtained their approval with the following script: "Our research design necessitates that we repeat some interviews. Therefore, we will be calling a random sample of respondents. It is unlikely that you will be called, but in the event you are recalled, would you mind being interviewed again with another person from our office?" Interviewers readministered the Quick DIS to a random sample of each other's previous interviewees. Completed interviews were scored by computer software thus ensuring the anonymity of results.

Statistical Analyses

Due to time constraints, the sample size of our DIS interview was limited to 782 subjects. We selected the individuals in our study who fell into three psychological screening categories: the first group who met criteria on the screening instruments, the second who didn't meet the criteria, and the third who could not be determined. Table 1 provides the sample sizes selected for the study and the weighted counts to the total volunteer population for each category.

The advantage of the stratified sampling procedure previously described is that it could yield minimally biased prevalence estimates, especially for disorders with low prevalence rates, such as those for some rare mental disorders. The results presented in all tables in this report are weighted to account for sample selection probabilities using the SAS-callable version of SUrvey DAta ANalysis (SUDAAN), a program developed by Research Triangle Institute, Research Triangle Park, NC, for the specific purpose of analyzing data from complex sample surveys.[37] SUDAAN permits the use of stratified data to obtain estimates using the proper design parameters, and it computes the appropriate standard errors of these estimates. Odds ratios and confidence intervals were calculated using the Crosstab Procedure.

RESULTS

Reliability of Quick DIS

We assessed the reliability of the Quick DIS for each individual diagnosis. The test-retest correlations (kappas) and confidence intervals for the diagnoses with acceptable reliability are shown in the top half of Table 2. They ranged from 0.46 to 1.00, with the lowest being alcohol disorder and the highest being depression and anorexia. The bottom half of Table 2 shows those diagnoses that did not demonstrate acceptable reliability with DIS tests-retests or could not be evaluated due to insufficient cases. This list included all of the phobias and personality disorders, which may be due, at least in part, to the small number of retests. Because kappa is sensitive to the base rate of the diagnosis, we calculated only those for which at least 3 positive cases of a particular diagnosis were found. The average agreement across the 4 diagnoses for which kappa could be estimated (excluding tobacco dependence) was .66, and compared to an average

of .60 for those same diagnoses obtained in a previous study of agreement between face-to-face and computer-prompted versions of the DIS.[38] Test-retest kappas were higher than face-to-face versus computer-prompted kappas for major depression, Posttraumatic Stress Disorder, and generalized anxiety disorder. Only alcohol abuse/dependence showed lower test-retest agreement than face-to-face versus computer-prompted interviewer agreement.

The response rate for the volunteers was 89%, resulting in a total interviewed sample of 782 Navy and Marine Corps personnel. Most nonrespondents had moved and did not have a forwarding phone number, or they were no longer in the Navy. Volunteers for the DIS were compared with the total questionnaire sample on their screening test outcomes to examine the potential for bias. Samples were very similar on the proportion that met criteria for depression on the CES-D alone but had slightly higher scores on the Hopkins-21, indicating that volunteers for the telephone interview evidenced somewhat higher levels of psychological distress than questionnaire respondents (Table 3). Equal proportions of men and women volunteered for the interview as well as responded to the questionnaire.

The relationship between the 2 screening tests and the Quick DIS was also examined (Table 4). It should be noted that the time periods for which the screening tests and the DIS inquired about were different; that is, the screening tests asked about symptoms during the last week, and the Quick DIS gave recent (within the last year) and lifetime diagnoses. For the CES-D, results showed a kappa of .39 , a sensitivity of .51 and a specificity of .88 for those with any recent disorder. That is, 51% of the personnel with any Quick DIS diagnosis within the last year (excluding tobacco use) met criteria for

depression on the CES-D within the last week. The predictive value (i.e., the number of individuals who met criteria on both the diagnostic and screening instruments divided by the number of people who screened positive on the screening instrument) was only slightly higher than the sensitivity. This predictive value was less than the sensitivity when the traditional cutoff score of 15 was used. With regard to the Hopkins-21, 42%, or 259 of the 545 participants with a DIS diagnosis, also met criteria for psychological distress on the Hopkins-21. The kappa and sensitivity were lower than with the CES-D, but the specificity was the same. When looking at the relationship of the two screening instruments taken together relative to the Quick DIS, it was found that 59% of the participants with a recent DIS diagnosis met criteria on either the CES-D or the Hopkins-21 within the last week.

Psychiatric Disorder as a Whole

Prevalence. One or more of the psychiatric disorders assessed in this study had been experienced at some time in their lives by 40% (unweighted n=403) of the Sailors and Marines, and 21% (unweighted n=257) had an active disorder, defined as a "disorder for which criteria had been met at some time in the person's life and at least one symptom (or one episode) has been present in the year prior to interview."[29] These figures compare with 32% lifetime and 20% annual prevalence rates from the ECA studies, and 48% lifetime and 29.5% annual prevalence rates from the National Comorbidity Survey (NCS).[39] However several differences in the calculation of rates should be noted. The same basic instrument was used in the ECA studies of the early 1980's but a different instrument was used by the NCS in the early 1990's. The ECA and NCS studies included a somewhat larger number of diagnoses than POWR in their definition of "any diagnosis"

including drug abuse/dependence, cognitive impairment, dysthymia, and schizophrenia. The initial ECA studies also did not include generalized anxiety disorder in their summary of "any diagnosis," whereas POWR did. An examination of the relative prevalence of these disorders in the general population (based on ECA study data) suggests that these exclusion and inclusion differences tend to cancel each other out and therefore, may still provide a basis for comparison. Since 40% have had a disorder, but only 20% have been active within the last year, 50% of those ever affected (40%/20%) must have recovered by the time of the interview. This is comparable to the 38% remission rate obtained in the ECA studies.[29]

Correlates. Table 5 shows the distribution of lifetime and active psychiatric disorder in demographic groups. The average age for both lifetime and recent cases was 31 years, and there were no significant differences between lifetime or active cases and noncases. Unlike the ECA and NCS studies in which the prevalence rates for any psychiatric disorder were significantly higher among younger adults,[27,39] no elevation in rates in comparable military age groups was observed. Such a difference in study rates may reflect the different mix of disorders, particularly the absence of drug use and disorders that are more prevalent in younger adults and/or confer less risk of death among the older military population.

There were also no significant differences between men and women among both active and lifetime cases. This was consistent with NCS findings[39] but differed from ECA observed rates in which men had significantly higher lifetime prevalence rates. This may be due to the mix of disorders covered, in particular, the exclusion of drug-use disorders and schizophrenia, which are more prevalent in men, and the inclusion of GAD,

which is more prevalent in women.[28] Also, while there were no significant differences among ethnic groups in lifetime or active cases observed in the present study, blacks had both higher lifetime and current rates than whites in the ECA studies[29] while the reverse was observed in the NCS studies.[39]

The distribution of cases by the highest educational level participants received showed higher rates of active disorder for high school graduates relative to participants who had had some college. There was also some differences within lifetime cases by marital status. Widowed, separated, or divorced participants had significantly higher rates than never-married participants. Married and living as married (combined) occupied the middle ground.

Correlates of remission included being male, age 30 or over, white, having higher than a high school education, being married, an officer, and a Marine.

Differences Between Specific Disorders

Prevalence. As in the United States as a whole, the most prevalent disorder among this military sample is nicotine dependence with 25% of all respondents meeting DSM-III-R criteria for lifetime nicotine dependence. For comparison, Andreski and Breslau [40] found a lifetime prevalence rate of 20% among young adults ages 21-30. After nicotine dependence, phobias, alcohol abuse, and depression were the most prevalent disorders (Table 6). While the lifetime prevalence of most psychiatric disorders was comparable to national prevalence rates, current or annual rates for most disorders were much lower. Two notable exceptions were the higher lifetime prevalence rates for major depressive disorder and PTSD. Sixteen percent of the military personnel in this sample had a major depressive episode at some time in their lives and 9% within the current year,

compared with 6% lifetime and 4% current prevalence in the general population.[29] The lifetime prevalence of PTSD was 12%, compared with 1-9% found in civilian population surveys;[7,41-43] however, both lifetime and annual rates were similar to those observed in a representative national sample of women.[44] The current prevalence of bulimia, 1.2%, was also slightly higher than the 1.0% observed in college samples of women.[45,46] Remission rates for specific disorders were highest for antisocial personality, and alcohol abuse, at 87% and 85%, respectively.

Gender Differences. Table 7 examines the distributions of specific disorders by gender. Significant gender differences were found among participants with a lifetime history of at least 1 of 5 psychiatric disorders: social phobia, PTSD, depression, alcohol dependence, and antisocial personality. Women had higher rates of phobias, PTSD, and depression, whereas men had higher rates of alcohol abuse and antisocial personality disorder. Among those with an active disorder, women had significantly more depression and PTSD than men. Rank and marital status were also associated with active PTSD showing enlisted and divorced personnel at highest risk (X^2_1=12.93, p=.0003, X^2_3=10.61, p=.0144), respectively). When these disorder rates were examined by sex and marital status, only divorced women were associated with higher lifetime rates of depression (X^2_3=11.93, p=.0079) and PTSD (X^2_3=10.18, p=.0176). Table 8 shows the crude odds ratios and confidence intervals for those lifetime and recent diagnoses. Women were at almost 5 times the risk of having a lifetime diagnosis of posttraumatic stress disorder than men and more than 5 times as likely to have a recent diagnosis. Women were more than twice as likely to have a lifetime diagnosis of a major depressive episode and at almost twice the risk to have a recent diagnosis. Men, on the other hand, were at significantly

higher risk for both a lifetime and recent diagnosis of alcohol dependence. An examination of the qualifying trauma required to meet DSM-III-R criteria for PTSD revealed that rape accounted for more than half of the cases of female PTSD (Table 9).

Co-occurrence. Table 10 shows the distribution of the number of lifetime and recent diagnoses made among personnel with any diagnosis (again, excluding tobacco dependence). Slightly over half of the personnel who received a DIS diagnosis were found to have 2 or more disorders, both among those with lifetime and those with recent diagnoses. The lifetime figures are similar to those found in the ECA studies and the National Comorbidity Survey.[47] Those studies found that among respondents with a lifetime history of at least 1 psychiatric disorder, 54% and 56% of the respondents also had one or more other disorders.[47]

Services Utilization Associated With Mental and Addictive Disorders

Of the 776 respondents, 84 (7%) reported use of any military medical facility and/or civilian doctor for mental health care in the last 12 months. Ten percent of all women in the sample and 3% of the men utilized services for mental health. Of those meeting diagnostic criteria for a mental disorder, 19% with an active disorder sought mental health care in the last year, and 14% with any lifetime disorder sought care. In contrast, more than a quarter (28.5%) of persons in the ECA studies with any disorder sought mental health or addictive services.[48] Military proportions who utilized services varied by disorder and gender, from 50% of women with panic disorder and men with antisocial personality disorder, to less than 5% for men with addictive disorders, phobias, or PTSD (Table 11). The most commonly treated cases were those with panic, obsessive-

compulsive, antisocial personality, and depression. Women who generally sought care more readily than men accounted for the majority of these cases.

DISCUSSION

This study has presented the preliminary findings of the first nonclinical epidemiological study of DSM-III-R criteria-based psychiatric diagnoses in the military. Evidence has been provided that active-duty Navy and Marine Corps women may be at substantially higher risk than men to experience both lifetime and current major depression and PTSD. Active-duty men, on the other hand, were much more likely than women to have had a lifetime history of alcohol abuse and antisocial personality disorder. With respect to the specific research questions posed in this investigation, their answers may be summarized as follows: First, active-duty Navy and Marine Corps personnel in this study who had experienced any lifetime or active disorder did not differ with regard to age, sex, ethnicity, or branch of service. Personnel who had experienced a disorder at some time in their life, however, were more likely to be enlisted and married, divorced or separated. Those with active disorders were more likely to be enlisted and have no college education. These data are consistent with previous studies, which have shown socioeconomic status to be an important correlate of psychiatric disorder and that may play a causal role in depression among women and antisocial personality and substance abuse among men.[39,49]

Second, although there were no significant differences between men and women in either lifetime or current overall rates of disorder, women had higher rates of major depression and PTSD. These disorders had lower remission rates than the alcohol dependence and antisocial personality diagnoses that were more prevalent in men. Thus,

women were less likely to recover from psychiatric disorder as a whole because the specific disorders they experienced had lower remission rates than the disorders men experienced. Third, this study found no evidence that African Americans or Hispanics (white or black) in the Navy or Marine Corps were at higher risk for psychiatric disorder in general than were whites. Fourth, the most common lifetime disorders experienced in this active-duty military sample were nicotine dependence, major depression, alcohol dependence, and phobias. The most prevalent active disorders were tobacco dependence, major depression, PTSD, and phobia.

Fifth, this study has shown that similar to national samples, over half of the military personnel with a lifetime history of at least 1 psychiatric disorder, also had 1 or more other disorders. Of interest was also the finding of a relatively high concordance between receipt of any active Quick DIS diagnosis (within the last year) and high levels of depressive and psychological distress symptomatology. This seems to point to the long-term or chronic course of most psychiatric disorders and relates to the final question posed. More than 81% of the Navy and Marine Corps personnel in this sample with an active DSM-III-R diagnosis had not sought mental health care, either from a military medical facility or a civilian doctor. Of the 13 disorders examined, treatment was most frequently sought for panic and obsessive-compulsive disorders and least frequently sought for alcohol and tobacco dependence.

The most unique aspect of this study was the opportunity to obtain DSM-III-R diagnoses on a population-based sample of active-duty military personnel and compare prevalence rates and demographic distributions with those obtained in national samples. Considering psychiatric disorder as a whole, lifetime and annual prevalence rates were

similar to those found in national studies using the same basic instrument, the DIS. Variations in overall lifetime and current rates by demographic variables may be due to differences in the mix of disorders measured in this and the ECA studies. Considering individual disorders, most lifetime and current prevalence rates tended to be comparable to or slightly lower than national rates except for major depressive episode and PTSD, which were considerably higher. It should be noted that the NCS studies also found a much higher prevalence rate of depressive disorder.[39] Given the well-known association between loneliness, lack of social support, low socioeconomic status, and depression, these data support the hypotheses that divorced women may join the military for social and/or economic security but are either entering the service in a clinically depressed state, entering with relatively low depression symptom levels, which increase to meet diagnostic criteria for major depression through exposures to trauma, stress, absence from loved ones, and so forth; or they are experiencing a recurrent episode after joining when anticipated solutions to their problems are not found within the military. Further, only PTSD was among the most prevalent disorders in this population, but it was not among the most prevalent disorders in the civilian population. Nevertheless, the high rate of history of female rape found in the present study is consistent with findings from a study of Navy basic trainees in which 45% of the women indicated that they had been the victim of attempted or completed rape.[50] Since both lifetime and current rates of PTSD were higher than expected, the onset of PTSD cannot be determined with the present data. That is, to properly design interventions, future studies will need to clarify whether women in the military with a history of PTSD are less likely to experience remission or are at higher risk for a subsequent disorder, or both. For example, it may be that a rape or

other trauma counseling intervention for women entering the service with a history of PTSD, may reduce the risk of subsequent disorder in women who are currently symptomatic, but not for those who are in remission (or vise versa). Because PTSD is highly comorbid with major depression and other psychiatric disorders, an important adjunct to these data will be to examine the comorbidity relative to qualifying traumas and other risk factors.

One of the most important findings of this study was the large number of active-duty personnel with a current psychiatric disorder (other than nicotine dependence) who had not sought treatment at a medical facility. It is hoped that help from alternative sources, such as the clergy, is being sought, although there are no data as yet to evaluate the comparative treatment outcomes of mental health resources in the military. One recommendation would be for the military medical community to take the lead toward removing the stigma or perceived punishment associated with mental illness within their ranks and to address treatment and prevention issues without adverse consequences to a Sailor's or Marine's military career. Such an approach may improve job performance, reduce the risk of suicide and stress-related illness, and lead to improved mental health among high-risk military personnel.

The main limitations to these findings relate to the retrospective character of the study data and the nature of the study sample. As with all studies that rely on self-reports, these data are subject to memory errors and recall bias. Also, the long-term reliability of diagnosing lifetime psychiatric disorder in a community sample has been called into question.[51] Potential problems assessing lifetime prevalence rates include differential

mortality in the various diagnostic groups, as well as possible cohort and memory effects.[52]

Several other factors may contribute to differences observed between military and national rates. (1) Telephone versus face-to-face interviews. Overall, the Quick DIS appeared more reliable for mood and addictive disorders and somewhat less reliable for diagnosing phobias and personality disorders; and while the Quick DIS facilitated computer assisted telephone interviews, the ECA studies used face-to-face interview versions of the DIS. Some evidence suggests that telephone respondents of national health surveys report more health events than do face-to-face respondents.[53] It would seem unlikely, however, that such an explanation would apply only to the particular diagnoses that had rates higher than national rates. Also, reliability studies on the agreement between computer- and interviewer-administered versions of the DIS show a moderate agreement between face-to-face and computer-prompted interview methods.[38] Although showing slightly higher overall test-retest agreement, the poorer test-retest agreement for alcohol dependence, as well as that for antisocial personality disorder, tends to decrease confidence in the prevalence rates for the largely male-predominate disorders and calls into question the validity of the Quick DIS for these particular diagnoses. (2) Differences between national rates. Although the present study was designed to yield comparative data to that of the ECA studies and therefore used the Quick DIS, several factors may make the data more comparable to NCS data. Some of these factors were cited as potential explanations for differences obtained between the ECA and NCS studies and are discussed elsewhere.[39] Some have relevance to the present data including secular and temporal trends and instrumentation differences (e.g., the

Quick DIS was based on DSM-III-R criteria as was the Composite International Diagnostic Interview, the instrument used in the NCS study, but the DIS used in the ECA studies was based on DSM-III criteria). The effect of such issues are difficult to evaluate and point to the need to obtain additional psychiatric diagnostic and risk factor information from a military probability sample of personnel. (3) Response and screening rates. Although typical for a large mail survey in the Navy, the overall response rate for the questionnaire was low. Although non-response bias cannot be ruled out, evidence suggests that potential biases may tend to counteract each other's effects. That is, it is likely that the military would be more hesitant than a community sample to admit to symptoms and that would lead, in turn, to an underestimate of the prevalence of psychiatric disorder in this study. On the other hand, the similarity of the volunteers for the telephone survey to the questionnaire respondents and their tendency to report slightly more psychological distress suggests a potential overestimate in prevalence rates. On the positive side, an unexpectedly high proportion (one third) of those respondents volunteered for the telephone interview. Future studies may want to reevaluate the choice of screening instruments and/or their cutpoints to increase their predictive value, (i.e., the Hopkins-21 contributed little over the CES-D to the detection of psychiatric disorder in this population). It is recommended that the combination of the CES-D and Hopkins-21 screening instruments and/or their cutpoints be modified to optimize sensitivity and specificity and to detect the range of psychiatric conditions in this military community. These screening issues are especially important because the identification of mild or subclinical conditions provides potential for early intervention and prevention of the disability associated with the full-blown illness.

COMMENT

Similar to findings in the civilian literature (ECA studies), Navy and Marine Corps women may be at higher risk for depression and PTSD, and men at higher risk for alcohol abuse/dependence. Such basic prevalence rates are necessary for the adequate planning and provision of health-care services. The higher rates of major depressive episode and PTSD, relative to national rates, are of particular concern for military readiness and will be targeted for future risk factor and intervention studies. Additional studies will also be needed to examine the onset of these disorders as occurring before or after enlistment as well as to examine the adequacy of psychological screening instruments used on entry into the services. We will continue to examine the vast amount of data this study has generated in an effort to focus on those risk factors for psychiatric disorder that may be unique to the Navy environment, as well as those contributing to some of the gender differences observed in this study.

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Table 1. Sample of Respondents and Weighted Counts by Psychological Screening Category				
Screening Category	Volunteers	Target Sample	Completed Sample	Weight
CES-D≥16 and/or Hopkins-21≥37	795	795*	494	1.61
CES-D<16 and Hopkins-21<37	2351	231†	229	10.27
CES-D and/or Hopkins-21 unknown	445	162†	59	7.54

*100% of the respondents who met criteria on the screening instruments.

†Based on an estimated 20% prevalence rate, 95% accuracy, and a 5% error rate.

Table 2. Test-Retest Correlations (Kappas) Between First and Second Quick DIS Interviews for Reliable Diagnoses*

Diagnoses	T-Absent/ R-Absent	T-Absent/ R-Present	T-Present/ R-Absent	T-Present/ R-Present	Kappa†	C.I‡.
Tobacco dependence	17	1	3	11	0.74	0.40—1.08§
Generalized anxiety disorder	25	2	2	3	0.53	0.18—0.87§
Posttraumatic Stress Disorder	20	3	2	7	0.63	0.28—0.97§
Depression	18	0	0	14	1.00	--
Anorexia	31	0	0	1	--	--
Bulimia	29	1	1	1	--	--
Alcohol dependence	24	4	1	3	0.46	0.13—0.79§
Panic disorder	29	0	3	0	--	--
Agoraphobia	28	2	2	0	--	--
Simple phobia	26	4	1	1	0.22	-0.09—0.52
Social phobia	25	1	4	2	--	--
Mania	31	0	1	0	--	--
Obsessive-compulsive disorder	30	2	0	0	--	--
Antisocial personality	29	2	1	0	--	--

*Test=T, retest=R, N=32
†Measure of agreement that also corrects for chance agreement, ranges from 0-1.
‡95% confidence interval.
§Significant at p<.05.
--Kappas not computed for diagnoses with fewer than 3 positive cases.

Table 3. Screening Test Results* for Quick DIS Interview Volunteers Relative to Total Survey Sample

Results of Screening Tests	Total Weighted Sample (N=9746) %	Volunteers for DIS Interview (N=3548) %	Non-volunteers (N=6198) %	Test Statistic† P Value
Met criteria for depression				
(CES-D$\geq$16)	16.4	19.1	14.9	$X^2_2 = 3.28$, $p=.21$
Met criteria for psych				
distress (Hopkins-21$\geq$37)	16.5	19.9	14.5	$X^2_2 = 14.9$, $p=.002$
Met criteria for depression				
and/or distress	21.1	23.8	19.7	$X^2_2 = 5.72$, $p=.07$
Male	88.5	88.4	88.6	$X^2_1 = 0.16$, $p=.69$
Female	11.5	11.6	11.5	

*Percentages weighted to total Navy and Marine Corps population.

†Comparing volunteers and nonvolunteers.

Table 4. Sensitivity and Specificity of CES-D in Detecting Active Psychiatric Cases*								
Screening Test and Cutoff Score								
Recent DIS†	**CES-D**		**CES-D**		**Hopkins-21**		**CES-D or Hopkins-21**	
Diagnosis	**<16**	**≥16**	**<15**	**≥15**	**<37**	**≥37**	**<16 or <37**	**≥16 or ≥37**
No. present	301	318	294	324	359	259	254	364
No. absent	2132	297	2081	349	2144	286	2014	415
Weighted No.	615		615		623		606	
Kappa	.39		.37		.31		.38	
(95% CI)‡	(.36, .43)		(.33, .40)		(.28, .35)		(.35, .42)	
Sensitivity	.51		.52		.42		.59	
Specificity	.88		.86		.88		.83	
Predictive value	.52		.48		.48		.47	

*Weighted No. N=713; excludes tobacco dependence only and missing data on screening instrument, weighted to volunteer population, screening tests asked about symptoms within last week, recent DIS represents symptoms within the last year.

†Quick Diagnostic Interview Schedule.

‡Confidence interval.

		Prevalence of Any Disorder in Percent*		
	No.†	**Lifetime Prevalence**	**Current in Last Year**	**Remission**
Total	773	39.71 (2.27)	20.63 (1.70)	48.05
Gender				
Men	321	37.74 (3.43)	17.22 (2.41)	54.37
Women	452	41.30 (3.02)	23.36 (2.36)	43.44
Age group				
<30	349	39.79 (3.43)	25.31 (2.86)	36.39
30 - 44	380	39.60 (3.18)	17.13 (2.13)	56.74
45 - 64	44	39.95 (9.22)	18.77 (6.84)	53.02
Ethnicity				
White	561	41.15 (2.70)	20.42 (1.95)	50.38
Black	97	39.02 (6.10)	21.19 (4.96)	45.69
Hispanic	115	32.77 (5.59)	21.13 (4.59)	35.52
Education‡				
12 years or less	322	44.99 (3.71)	25.49 (3.02)†	43.34
Some college or more	451	36.55 (12.84)	17.70 (2.00)	51.57
Marital history				
Married, never divorced/separated	467	39.67 (2.89)†	19.25 (2.11)	51.47
Single, never cohabited for 1 year	133	24.79 (4.44)	17.17 (3.63)	30.74
Divorced/separated/widowed	130	55.92 (5.96)†	30.31 (5.07)	45.80
Unmarried and cohabiting	43	38.83 (9.65)	19.86 (6.22)	48.85
Paygrade				
Enlisted	654	41.87 (2.52)†	23.60 (2.00)†	43.64
Officer	119	30.13 (5.09)	7.51 (2.03)	75.07
Service				
Navy	678	38.63 (2.38)	20.96 (1.82)	45.74
Marine	95	48.95 (7.11)	17.74 (4.45)	63.76

Table 5. Prevalence of any Psychiatric Disorder by Demographic Variables

†*Tested (t test) against lowest value, p≤.05.*

Weighted to volunteer population; values given as percent and standard error.

‡*Categories not equivalent to ECA studies due to insufficient sample size with less than high school education.*

Table 6. Prevalence of Specific Disorders			
Disorders	**Lifetime**	**Current (1 year)**	**Remission**
Tobacco	25.00 (2.02)	14.57 (1.58)	41.72
Somatization	0	0.00 (0.00)	0.00
Panic	1.83 (0.47)	1.11 (0.29)	39.34
Generalized anxiety	3.64 (0.61)	2.42 (0.46)	33.52
Phobia	12.85 (1.41)	8.65 (1.15)	32.68
Posttraumatic stress	11.59 (1.36)	5.64 (0.95)	51.34
Major depressive episode	16.08 (1.46)	9.08 (1.00)	43.53
Manic episode	0.40 (0.14)	0.31 (0.12)	22.50
Anorexia	0.29 (0.29)	0.00 (0.00)	1.00
Bulimia	1.56 (0.46)	1.20 (0.44)	23.08
Alcohol abuse/dependence	14.81 (1.62)	2.22 (0.61)	85.01
Obsessive-compulsive	2.15 (0.66)	1.20 (0.44)	44.19
Antisocial personality	2.09 (0.52)	1.28 (0.11)	86.60

*Values are given as percentage standard error.

Disorder	Lifetime		Current (1 year)	
	Men	**Women**	**Men**	**Women**
Tobacco	28.8 (3.2)	21.9 (2.6)	15.3 (2.4)	13.9 (2.1)
Somatization	0	0	0	0
Panic	2.3 (0.9)	1.5 (0.3)	1.2 (0.5)	1.1 (0.3)
Generalized anxiety	2.9 (0.8)	4.2 (0.9)	1.5 (0.4)	3.2 (0.8)
Phobia	10.6 (2.0)	14.6 (2.0)*	7.5 (1.7)	9.6 (1.6)
Posttraumatic stress	4.4 (1.3)	17.4 (2.2)*	2.4 (1.1)	8.3 (1.5)*
Major depressive episode	9.0 (1.5)	21.9 (2.3)*	5.4 (1.0)	12.0 (1.6)*
Manic episode	0.2 (0.1)	0.6 (0.2)	0.1 (0.1)	0.5 (0.2)
Anorexia	0	0.5 (0.5)	0	0
Bulimia	0.9 (0.7)	2.1 (0.6)	0.9 (0.7)	1.4 (0.6)
Alcohol abuse/dependence	21.7 (2.9)	9.2 (1.7)*	3.3 (1.1)	1.3 (0.7)
Obsessive-compulsive	2.4 (1.1)	1.9 (0.8)	0.5 (0.2)	1.8 (0.8)
Antisocial personality	4.0 (1.1)	0.6 (0.2)*	0.4 (0.2)	0.2 (0.1)
Overall	37.7 (3.4)	41.3 (3.0)	17.2 (2.4)	23.4 (2.4)

Table 7. Prevalence of Specific Disorders by Gender*

Weighted to volunteer population, t test between men and women, p<.05, in percent and SE.

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Table 8. Odds Ratios and Confidence Intervals for Significant Gender Differences* in Selected Lifetime and Recent Psychiatric Diagnoses

Diagnosis	Lifetime		Recent (in last 12 months)	
	OR	(95% CI)	OR	(95% CI)
PTSD	4.14	(2.12, 8.08)	3.62	(1.33, 9.86)
Major depressive episode	2.85	(1.81, 4.48)	2.41	(1.49, 3.88)
Alcohol abuse/dependence	0.36	(0.21, 0.61)	0.39	(0.12, 1.30)
Antisocial personality	0.24	(0.11, 0.55)	0.40	(0.07, 2.24)
Agoraphobia	2.26	(1.00, 5.14)	2.70	(0.94, 7.73)
Overall (any diagnosis)	1.15	(0.79, 1.67)	1.47	(0.96, 2.23)

Odds ratio = OR, confidence interval = CI, male = 0, female = 1.

Table 9. Distribution of Qualifying Trauma Among Lifetime* Posttraumatic Stress Disorder Cases by Gender

Trauma	Males No. (%)	Females No. (%)	Total No. (%)
Rape	0	60 (52.4)	60 (42.8)
Seeing someone hurt/killed	7 (22.7)	10 (4.7)	17 (8.0)
Being attacked	4 (19.3)	15 (8.9)	19 (10.8)
News of sudden death	2 (15.2)	13 (16.7)	15 (16.4)
All others	10 (42.8)	17 (17.3)	27 (22.0)

Distribution similar for current cases but smaller sample sizes.

†$X^2_4=14.9$, p=.005.

# Diagnosis	Lifetime		Recent (in last 12 mos.)	
	Frequency	Percentage	Frequency	Percentage
1	180	56.45	131	59.60
2	112	22.54	83	23.74
3	52	10.65	28	10.81
4	43	6.50	12	3.59
5	24	3.85	10	2.24

Table 10. Comorbidity of Lifetime and Recent Diagnoses Among US Navy and Marine Corps Volunteers With any Diagnosis*

Excludes tobacco dependence; based on 15 diagnoses assessed with the Quick DIS.

Table 11. Navy and Marine Corps Personnel Reporting any Mental Health Care During Last Year by Gender and Diagnosis*

Recent Disorder (in last 12 months)	Men		Women		Both	
Tobacco	2.63	(1.3)	12.89	(5.3)	8.02	(2.9)
Panic	34.23	(18.5)	50.00	(15.8)	41.50	(13.2)
Generalized anxiety	20.00	(10.3)	17.98	(7.4)	18.61	(6.0)
Phobia	4.00	(2.4)	17.72	(6.0)	12.31	(3.9)†
Posttraumatic stress	4.14	(4.4)	27.80	(8.6)	22.64	(7.1)†
Major depressive episode	12.87	(4.7)	39.70	(7.1)	32.29	(5.6)†
Manic episode	0.00		0.00		0.00	
Anorexia	0		0		0	
Bulimia	0.00		8.56	(8.7)	4.75	(4.9)
Alcohol abuse/dependence	2.99	(3.0)	7.11	(7.8)	4.21	(3.1)
Obsessive-compulsive	20.00	(17.9)	45.18	(22.8)	40.29	(19.0)
Antisocial personality	50.00	(25.0)	0.00		33.33	(19.3)†
Overall	6.55	(2.1)	26.84	(5.0)	18.95	(3.4)†

*Values are given as percent and standard error.

†Weighted to volunteer population, t test between men and women, p<.05.

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13. ABSTRACT (Maximum 200 words)
Patterned after the large national health surveys, the 1995 Perceptions of Wellness and Readiness Assessment was designed to provide baseline health and risk factor information on the health and mental health status of women in the US Navy and Marine Corps. A population-based, two-stage, cluster sample of nearly 10,000 active-duty Navy and Marine Corps women and men were screened for above-normal levels of psychosocial distress and depressive symptomatology using standard cut-points on two psychiatric screening instruments. A clinically based, structured computerized telephone interview was administered to subsamples of both positive- and negative-screening volunteers to make Diagnostic Statistical Manual-III-R psychiatric diagnoses. Estimates were 40% and 21% for overall lifetime and one-year prevalence of psychiatric disorders, respectively. Higher risks of disorders were associated with being enlisted, ever married, and having no college education. Women had about five times the risk of experiencing Posttraumatic Stress Disorder than men and about twice the risk of a major depressive episode. Women generally sought treatment more readily than men. Similar to findings in the civilian literature, Navy and Marine Corps women
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may be a higher risk for depression and Posttraumatic Stress Disorder, and men are at higher risk for alcohol abuse/dependence.