

Hospital Utilization and Personality Characteristics of Veterans With Psychiatric Problems

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Objective: The relationship between hospital utilization and psychometric, demographic, and diagnostic data was examined among veterans with psychiatric problems. **Methods:** Data were obtained from the records of 500 psychiatric inpatients admitted to a Veterans Affairs medical center between 1984 and 1987 and followed for four years. All patients completed the Minnesota Multiphasic Personality Inventory, the California Personality Inventory, the Millon Clinical Multiaxial Inventory, and the Psychological Inventory of Personality and Symptoms. Stepwise linear regression analysis was used to predict the number and length of inpatient stays, and Cox and logistic regression analyses predicted rehospitalization. **Results:** Higher rates of psychiatric hospital utilization were found among patients who were unmarried, who had disabilities connected with their military service, who had lower levels of adaptive functioning, and who were diagnosed as having posttraumatic stress disorder, drug or alcohol use disorder, or passive-aggressive or antisocial personality disorder. Higher utilization was also found among those whom psychometric data characterized as less responsible and more compulsive. The data also predicted the length of subsequent medical hospitalization and identified patients who stayed out of the hospital longer and who were not rehospitalized. **Conclusions:** Hospital utilization was found to be a function of psychiatric diagnosis, marital status, and various personality factors. Factors relating to social disadvantage also played a role. Axis I diagnoses, particularly substance use disorders, were as important as, if not more important than, axis II diagnoses in predicting utilization. (*Psychiatric Services* 49:370-375, 1998)

Psychiatric inpatients are one of the largest patient groups in the Veterans Affairs health care system. Nine out of ten veterans with psychiatric disabilities connected to

their military service have been hospitalized since their military discharge. Twenty-four percent have been hospitalized 11 or more times (1), yet few studies (2-4) have exam-

ined what might predict this high use of expensive treatment.

Recent literature suggests that inpatient psychiatric hospitalization is related to social disadvantage and the severity of psychiatric illness. One study found that frequently hospitalized patients were more likely to be diagnosed as having an alcohol-related, psychotic, or major depressive disorder (2). Researchers concluded that race, marital status, social class, level of adaptive functioning, and severity of symptoms distinguish frequent users of inpatient psychiatric services. Others found that race, sex, chronic unemployment, and a history of hospitalization were the strongest predictors of hospital utilization (3).

Another study found that frequent users of acute inpatient psychiatric services were predominantly men with multiple problems (4). They were typically white and had diagnoses of schizophrenia, bipolar disorder, or borderline personality disorder, had a history of violent or fear-inducing behavior and involvement in the criminal justice system, and had difficulty managing money and maintaining housing.

Friedman and West (5) found that frequent users of VA outpatient psychiatric care were more chronically psychiatrically disabled. They found no relationship between treatment utilization and demographic variables, psychiatric symptoms, or clinical improvement. They did not de-

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termine whether the frequent users in their study differed in personality characteristics or ability to cope with stress; however, the frequent users had more outpatient medical visits, although not more inpatient medical utilization. Friedman and West concluded that VA disability ratings and a history of seeking treatment predicted outpatient psychiatric utilization better than current clinical need. Another VA study found that inpatient and outpatient medical utilization was higher among patients with psychiatric and medical admissions than among those with medical or psychiatric admissions alone (6).

Previous investigators (2-4,7-9) have studied the relationship between inpatient utilization and diagnostic and demographic variables among nonveterans. They have not examined how psychometric measures predict hospital utilization or identify patients who stay out of the hospital or who are subsequently hospitalized, nor have they investigated factors influencing use of medical hospitalization among psychiatric patients despite these patients' potential need for increased medical care. The study reported here investigated how demographic, diagnostic, and personality characteristics are related to hospital utilization among VA psychiatric patients.

Methods

Our sample was drawn from 1,137 psychiatric inpatients admitted to an open inpatient psychiatric unit at the Houston VA Medical Center between 1984 and 1987. Most patients admitted to this unit were diagnosed as having posttraumatic stress disorder (PTSD) and various personality disorders. At admission they often had acute life crises, chronic health problems, and related problems with drug dependence or alcoholism.

All patients admitted to the unit were asked to complete psychological tests consisting of the Minnesota Multiphasic Personality Inventory (10), the California Personality Inventory (11), the Millon Clinical Multiaxial Inventory (12), and the Psychological Inventory of Personality and Symptoms (13). We excluded patients who could not read the test

questions, refused to take the tests, gave invalid responses, or left the hospital without completing the testing. For the 500 patients remaining in the sample, we used *t* tests to compare the scores on the test subscales. We used the diagnoses listed in the discharge summary from the patient's first hospital admission.

We extracted information about hospital utilization and demographic characteristics (race, sex, age at discharge, marital status, and service-connected disability status) from the VA patient treatment file (PTF). The PTF contains admission, diagnostic,

to identify personality, demographic, and diagnostic variables that predicted inpatient hospital utilization. To control the skewness of the regression data, we used the square root of the number of stays and the log of the total length of stay (14). (Without the transformation, the variance and mean tend to be correlated with the number of stays. Using the square root of the number of stays avoids this difficulty. Correspondingly, with data on length of stay, the standard deviation and the mean tend to be correlated and proportional. Using the log of the time data avoids this difficulty.)

We also analyzed the data for variables identifying patients who stayed out of the hospital longer (using the Cox proportional hazards regression model), those who did not return during follow-up, and those who returned to medical instead of psychiatric beds (using logistic regression).

Results

Patients



The 500 patients in the sample were typically unmarried white men whose disability was not service connected. The sample consisted of 466 men (93.2 percent) and 34 women (6.8 percent). A total of 382 patients were white (77.3 percent), 89 were black (18 percent), and 23 were Hispanic (4.7 percent). One hundred eighty-three (38.8 percent) were married. Fifty-three (10.6 percent) had service-connected disabilities.

Among the 637 patients who did not complete the psychological testing, blacks were significantly over-represented (27.9 percent), as were those with service-connected disabilities (17 percent).

Predicting hospital utilization

All the regression models, except that for the number of medical stays, successfully predicted hospital utilization. They had R^2 values of .2 or higher.

As Table 1 shows, several key variables predicted a higher number of psychiatric hospital stays. Among demographic variables, having a service-connected disability was important. The key diagnostic variables in-


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and demographic data for each admission to a VA hospital. To maintain an equal time-at-risk among all patients, we compiled hospital utilization data for four years, beginning with the patient's first admission date in the period. Thus the follow-up period began as early as 1984 or as late as 1987 and ended as early as 1988 or as late as 1991.

To compile utilization data, we searched the PTF from 1984 to 1991, deriving four dependent variables measuring utilization over the four-year follow-up period: the number of hospital stays and the total length of stay for each patient's psychiatric and medical admissions.

We used stepwise linear regression

Table 1

Stepwise linear regression models predicting hospital utilization among 500 veterans who were psychiatric inpatients

Model and variable	Coefficient	p
More psychiatric hospitalizations ¹		
Demographic		
Service-connected disability	-.407	<.001
Diagnostic		
Antisocial personality disorder	.316	<.001
Drug abuse	.237	.01
Posttraumatic stress disorder (PTSD)	.171	.04
Passive-aggressive personality disorder	.189	.01
Lower adaptive functioning ²	.09	.005
Psychometric		
Alcohol problems ³	.006	<.001
Less responsible ⁴	-.01	.003
More compulsive ⁵	.006	.002
More avoidant ³	.01	.002
More narcissistic ⁵	.004	.02
Longer psychiatric stays ⁶		
Demographic		
Not married	.2	.02
Service-connected disability	-.566	<.001
Diagnostic		
Antisocial personality disorder	.247	.04
Passive-aggressive personality disorder	.223	.03
Lower adaptive functioning ²	.131	.003
Psychometric		
Drug problems ³	.009	.007
Higher affective depression ³	.009	.001
More compulsive ⁵	.011	<.001
Less responsible ⁴	-.01	.03
More hypomanic ⁵	.003	.05
Time		
Not admitted in 1986	-.372	<.001
Not admitted in 1987	-.305	.004
Longer medical stays ⁷		
Demographic		
Not married	.72	<.001
Diagnostic		
Narcissistic personality disorder	.151	.003
Dependent personality disorder	.514	.02
PTSD	.35	.03
More severe stressors ⁸	.131	.03
No histrionic personality disorder	-.619	.03
No borderline personality disorder	-.554	.04
Psychometric		
More schizotypal ⁵	.025	<.001
More histrionic ⁵	.015	.002
Less dependent ³	.006	.009

¹ R² = .256

² As measured by the Global Assessment of Functioning, *DSM-III-R* axis V

³ As measured by the Psychological Inventory of Personality and Symptoms

⁴ As measured by the California Personality Inventory

⁵ As measured by the Millon Clinical Multiaxial Inventory

⁶ R² = .203

⁷ R² = .237

⁸ As measured on *DSM-III-R* axis IV

cluded being diagnosed as having a substance use disorder, PTSD, and an antisocial or passive-aggressive personality disorder and having lower adaptive functioning. Psychometric measures indicating lower scores on responsibility and higher scores on the proclivity for alcohol abuse and compulsive, avoidant, and nar-

cissistic behavior also significantly entered the model, although the latter two variables did not appear to be significant in the other models.

Virtually the same variables predicted longer psychiatric stays, except the model added marital status and marker variables for the time the patient was first hospitalized. Psy-

chometric variables measuring affective distress completed the model. The model differed from the one for more hospital stays in that a psychometric measure of drug abuse entered, but a diagnosis of drug abuse and a psychometric measure of alcohol abuse did not. Similarly, patients with PTSD had significantly longer psychiatric stays, but this variable also failed to enter the model.

Psychiatric patients with longer medical stays were typically unmarried. They had more severe life stress and were more likely to be narcissistic, dependent, or have PTSD, but they were less likely to have histrionic or borderline personality disorder. On psychometric measures they exhibited signs of schizotypal and histrionic personality disorders but not features of dependent personality disorder.

Prediction of longer community stays

Table 2 shows the variables associated with longer community tenure after discharge. Cox regression analyses determined that patients who stayed out of the hospital longer were less likely to have a problem with alcohol or a service-connected disability and less likely to be diagnosed as having PTSD, bipolar disorder, or passive-aggressive personality features. Their adaptive functioning was higher. Psychometric measures indicated that they were more likely to be described as capable, conscientious, responsible, and reasonable.

Logistic regression indicated that patients who did not return to the hospital during the four-year follow-up period were more likely to be black and were more likely not to have a service-connected disability. They were more likely to have obsessive-compulsive personality disorder and were less likely to have antisocial personality disorder. Psychometric measures described them as less distressed, less prone to abuse alcohol, better able to express their hostility, and more independent and rebellious.

Among patients who returned to the hospital, the variables distinguishing those rehospitalized in psychiatric beds from those in medical

beds were weighted toward severe mental illness. Patients rehospitalized on a psychiatric unit were more likely to be diagnosed as having borderline personality disorder. Psychometric measures described them as more suspicious, paranoid, and schizoid but less cold and egotistical than patients rehospitalized on a medical unit.

The importance of time

The hospital's policy on inpatient length of stay changed during the study period. Psychiatric and medical lengths of stays were shortened significantly beginning in fiscal year 1985–1986. Although the unit admitted more patients over time, the number of stays per patient did not change regardless of whether the patient had a medical or a psychiatric admission.

Discussion and conclusions

We found demographic, diagnostic, and personality variables that are complex but predictable determinants of VA inpatient hospital utilization. Our findings indicate that patients with different psychiatric diagnoses have different rates of hospital utilization and that axis II problems are probably less important than axis I problems. Our data highlight the fact that substance abuse is an important determinant of psychiatric hospital utilization, even when patients are not being primarily treated for it. Personality factors, measured by psychological testing, tended to round out the prediction of psychiatric hospital utilization, emphasizing the patient's level of responsibility and affective disturbance.

The model for longer medical stays among these psychiatric patients differed from the model for longer psychiatric stays in that marital status, psychiatric diagnosis, and psychometric measures suggestive of subtle personality factors were more predictive of longer medical stays, whereas admission date, service-connected disability status, and a history of substance abuse were less predictive. Our data suggest that psychiatric patients with medical hospitalizations are a slightly differ-

Table 2

Models predicting longer stays out of the hospital and rehospitalization in a psychiatric or medical bed among 500 veterans who were psychiatric inpatients

Model and variable	Odds ratio	95% CI	Parameter	p
Longer stays out of the hospital ¹				
Less likelihood of an alcohol problem ²			.009	<.001
No posttraumatic stress disorder			.286	<.001
More responsible ³			-.014	.01
No service-connected disability			-.452	.02
No passive-aggressive personality disorder			.351	.02
Higher adaptive functioning ⁴			.157	.02
No bipolar disorder			.283	.02
Patients who were not rehospitalized ⁵				
Less likelihood of an alcohol problem ²	1.57	1.28–1.94	-.227	<.001
A non-service-connected disability	3.15	1.39–7.16	1.148	.01
Less confused and anxious ⁶	2.13	1.52–2.97	-.038	<.001
More rebelliousness ⁶	2.08	1.41–3.06	.037	<.001
Obsessive-compulsive personality disorder	2.75	1.21–6.27	1.013	.02
No antisocial personality disorder	2.25	1.19–4.23	-.809	.02
Black race	2.04	1.20–3.46	.713	.01
Less overcontrolled hostility ⁶	1.49	1.02–2.17	-.020	.04
Patients who were rehospitalized in a psychiatric bed instead of a medical bed ⁷				
Paranoid personality traits ²	1.47	1.19–1.82	.019	<.001
Schizotypal traits ⁸	1.79	1.23–2.61	.029	.003
Borderline personality disorder or traits	2.45	1.20–5.01	.898	.02
Less cold and egotistical ³	1.6	1.01–2.54	.023	.05

¹ The model is based on Cox proportional hazards regression.

² As measured by the Psychological Inventory of Personality and Symptoms

³ As measured by the California Personality Inventory

⁴ As measured by the Global Assessment of Functioning, *DSM-III-R* axis V

⁵ The model is based on logistic regression. Concordant=72.5 percent; discordant=27.2 percent; tied=.3 percent

⁶ As measured by the Minnesota Multiphasic Personality Inventory

⁷ The model is based on logistic regression. Concordant=70.4 percent; discordant=29.2 percent; tied=.4 percent.

⁸ As measured by the Millon Clinical Multiaxial Inventory

ent subgroup of psychiatric patients—namely, they are more likely to be experiencing the stress of trauma or of their environment and less likely to be emotionally distressed and to use drugs or alcohol to escape their problems.

We found that veterans with service-connected disabilities are heavy consumers of inpatient resources. They are the patients whom VA is designed to serve. Thus we can extend Friedman and West's outpatient results (5) to inpatients and can report that patients with service-connected disabilities require more VA psychiatric hospitalization. However, we found a relationship between treatment utilization and personality and demographic characteristics as well as psychiatric diagnoses.

We found that marital status predicted the length but not the number of psychiatric and medical hospital-

izations. Our results differed from those of a study by Fabrega and associates (2), which found that marital status was associated with both the length and the frequency of psychiatric hospitalization. Marital status did not predict the postdischarge status of these patients but rather the consumption of hospital resources.

Among patients with axis I disorders, those diagnosed as having PTSD, major depression, a substance use disorder, and bipolar disorder consumed more hospital resources. Our results concurred with those of authors studying patients with PTSD (15), depression (7), and substance abuse (2,4), although Havassy and Hopkin (3) reported that substance abusers were not more likely to have multiple admissions.

Among patients with axis II disorders, evidence was found that those

with antisocial and passive-aggressive personality disorders used more inpatient psychiatric resources. Narcissistic and dependent patients had longer medical stays, while histrionic and borderline patients had shorter medical stays. Those with borderline personality disorder were almost two and a half times more likely to return to psychiatric beds than to medical beds. Like Fabrega and associates (2), we did not find that axis II disorders were more predictive of hospital use than other variables associated with personality disorders, other diagnoses, and demographic characteristics. Our data concur with those from other studies indicating that diagnostic variables alone poorly predict inpatient hospital use (2,16).

We also found that patients with lower axis V ratings required more psychiatric hospitalization and those with higher axis IV ratings required more medical hospitalization.

Psychometric measures of substance abuse, degree of responsibility, compulsivity, and affective distress were related to higher psychiatric hospital utilization. Psychometric measures of histrionic distress and schizotypal behavior were associated with longer medical stays.

During the study period, hospital policy on length of stay changed. The length of psychiatric and medical stays decreased after 1985. The study does not tell us the impact this change had on patient treatment. The Houston VA Medical Center followed national trends in reducing the length of inpatient stays and increasing the number of inpatient admissions (17,18), but, contrary to trends, the center maintained the same admission rate.

The models we used satisfactorily predicted medical length of stay but not the number of medical hospitalizations. Logically, we would have been more successful predicting utilization of medical hospitalization if we had data on patients' physical health. Because we were as successful in predicting both medical and psychiatric length of stay, our models did not explain all of the variation or account for all of the factors determining both psychiatric and medical hospital utilization.

The variables that identified patients who stayed out of the hospital longer or who did not return to the hospital tended to be the same variables that identified patients with less hospital utilization. Hence, hospital utilization and longer tenure out of the hospital were related. However, the variables that identified patients who returned to psychiatric beds instead of medical beds suggest that the former had more severe psychiatric disturbance.

We recognize limitations of the validity of these results and the generalizability of the findings to the gen-

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eral population. First, only 44 percent of the total sample completed psychological testing; however, the completion rate is substantial for this alienated, impulsive patient population. Patients who completed the testing had longer lengths of psychiatric hospitalization and slightly more were white and had disabilities that were not service connected. Patients who stayed in the hospital longer were more likely to complete the testing because they had more time to complete it.

Veterans with service-connected disabilities had longer lengths of

stay, but we suspect they were a clinically more dysfunctional group and more resistant to completing psychological testing. Service-connected disability implies that a veteran's chronic medical condition is a direct result of his or her service in the military. These patients typically are unable to work and have long-term difficulties establishing and maintaining interpersonal relationships and dealing with the effects of trauma or their psychiatric symptoms. Thus they are frequently more impaired than other VA psychiatric patients. Service-connected psychiatric disabilities are generally not personality disorders or substance use disorders but major mental illnesses or the effects of trauma.

Several authors have suggested that race is a more significant determinant of hospital utilization (2,3,9) than our results reveal. In addition, our results may not be generalizable to all women veterans because our sample included only 34 women.

We do not believe these modest differences seriously compromise our findings. Indeed, we would argue that these results are applicable to veterans in general and that, based on similar findings in nonveteran populations, they speak to the population of psychiatric inpatients as a whole.

An additional limitation is that some patients may have been hospitalized outside the VA hospital system during the study. It was not feasible for us to search the records of other hospitals. However, the majority of our patients tend to rely exclusively on VA for their medical and psychiatric health care.

Finally, the reliability of PTF data is an issue. Fortunately, quality control procedures are used in gathering and inputting data into this database. Several authors (19,20) studied these procedures and found that the utilization and demographic data—the only portions we used in this study—were highly reliable. We did not use the less reliable diagnoses recorded in the PTF but rather the diagnoses in the patient's hospital discharge summary.

This study identified patients who consumed larger proportions of VA

inpatient resources and who required more treatment. We concur with others (2-4,16) that inpatient resources are sometimes used to house patients who are temporarily homeless and jobless, have limited personal resources, and display troublesome behavior in their community. Our results indicate that personality features not identified by psychiatric diagnoses also affect hospital utilization by psychiatric patients. Because marital status was a key predictor of length of hospital stay, VA might save money on inpatient treatment by providing support and family therapy for veterans' spouses and children to help them maintain family stability.

This study found that specific diagnostic, personality, and demographic variables affected hospital utilization. The results suggest future studies to investigate sources of unexplained variance, including treatment variables, other patient characteristics, and the predispositions of attending physicians. This study reinforces the need for clinical research into more effective treatment for patients with problems such as PTSD, alcoholism, and substance abuse. We recommend that research target the profiled high-risk patients to determine whether outreach programs or earlier psychiatric, psychotherapeutic, and social treatments reduce hospital utilization and save money. Will reduced utilization and costs decrease the quality of care for these high-risk patients, or can thoughtful community alternatives be developed to serve the needs of patients, family members, and taxpayers? These questions need to be addressed. ♦

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