

Psychiatric Recidivism Prediction Factors

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A variety of factors affect recidivism. According to Gruber (1982) and Solomon and Doll (1979), variables that affect recidivism can be grouped into two broad categories: pathway and gatekeeper. Pathway variables, such as age, sex, social class, and number of dependents, are those that propel the potential patient toward the hospital. Gatekeeper variables, such as type of diagnosis, hospital admission policies, and patient's admission history, are those within the hospital environment. This study examined differences among gatekeeper and pathway variables between patients with and without readmissions to an inpatient psychiatric facility. Gatekeeper and pathway variables were examined in a sample of 316 ($n = 83$ no readmissions, $n = 233$ readmissions). Differences were found ($p < .05$) for the following variables between the groups: race, marital status, marital history, number of children, residency of children, other admissions, and such problems as marital, financial, social, work, sexual, impulse control, sleep, medical, central nervous system (CNS), compliance with medication, and compliance with treatment. Log linear analyses identified the pathway variables of sex, child's residency, and admissions to other hospitals as most predictive of readmission status, whereas the gatekeeper variables most predictive of readmission were financial, sexual, and impulse control problems.

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PROBLEM

Recidivism is the relapse of a disease, symptom, or behavioral pattern that results in the readmission of a patient to a treatment program. Studies have shown that a variety of factors affect recidivism. Studies examining recidivism rates for alcoholics and criminals have demonstrated the complexities and difficulties inherent in developing profiles for relapse (Ashford & LeCroy, 1990; Benda, 1987; Gellen, Fisher, & Simm, 1990; Watson, 1987). Rabiner, Wegner, and Kane (1986) found that noncompliance with medication regimens, longer duration of illness, and premorbid personality were associated with psychiatric recidivism. Fisher and Lohman (1977) found that the patient's diagnosis and previous admissions correlated with outcome measures such as psychiatric recidivism. In a 25-year review of psychiatric recidivism studies, Rosenblatt and Mayer (1974) uncovered only one variable that consistently predicted recidivism: the number of previous admissions. A number of studies (Hanson & Babingian, 1974; Horowitz, 1977; Richart & Millner, 1968) have shown that psychiatric readmissions are disproportionately distributed among the unemployed, the poor, Blacks, females, the unmarried, and the aged.

As already mentioned, Gruber (1982) and Solomon and Doll (1979) found that variables that affect recidivism could be grouped into two broad categories: pathway and gatekeeper. In a study of pathway and gatekeeper variables, Gruber (1982) found that gatekeeper variables were themselves useful in predicting psychiatric length of stay. However, additional information in the form of pathway variables was needed to adequately explain differences in psychiatric recidivism. Specifically, recidivism and length of stay were inversely related: Patients with high recidivism rates, for example, tended to have relatively short lengths of stay. In addition, women, older patients, persons from lower socioeconomic levels, and those with few dependents had higher readmission rates. However, Gruber failed to investigate other pathway variables, such as educational level, employment status, and current marital status, and other gatekeeper variables, such as major problem areas and family psychiatric history, that might have an impact on psychiatric recidivism.

In the past 10 years, efforts have been directed toward the education of patients with chronic conditions, such as schizophrenia, in an attempt to decrease recidivism (Bernheim & Lehman, 1985; Goldman & Quinn, 1988; Hogarty, Anderson, & Reiss, 1987; Miller, 1989; Williams, 1989). A psychoeducative model has been developed that focuses on teaching the patient and his or her family how to recognize signs of relapse and to use effective

coping mechanisms. This approach may also include group therapy, wherein a patient and his or her family may address problem situations already present and explore options for resolution (Miller, 1989). The psychoeducative model has proven effective in reducing recidivism rates in the first year postdischarge (Hogarty et al., 1987).

Readmission to a treatment program is costly for the individual, the family, and, ultimately, society. The cost per day in an inpatient psychiatric facility in a typical western state is estimated at \$114.96 (Austin, Texas Department of Mental Health and Mental Retardation, Office of Management, personal communication, 1987). Readmission also places tremendous strain on an already vulnerable individual and family system. In addition, the multiple readmissions of a patient frustrates and often demoralizes treatment personnel. Nurses are constantly seeking more effective intervention to decrease recidivism. Because nurses are responsible for the 24-hour care of hospitalized patients, they play a key role in both the identification of factors that could affect relapse and the development of treatment interventions to prevent relapse. Consequently, it is important for nurses to identify variables that facilitate a patient's ability to remain outside the psychiatric hospital.

PURPOSE OF THE STUDY

This study had four goals:

1. Identify pathway and gatekeeper variables descriptive of psychiatric inpatients who experienced readmissions to a specific inpatient psychiatric hospital
2. Identify pathway and gatekeeper variables descriptive of psychiatric inpatients who did not experience a readmission to a specific inpatient psychiatric hospital
3. Identify differences in pathway and gatekeeper variables between psychiatric inpatients who experienced a readmission and those who did not experience a readmission
4. Identify the pathway and gatekeeper variables most predictive of readmission.

METHOD

Pathway variables were conceptualized as demographic and social characteristics that propel a potential patient toward hospitalization. The pathway variables used in this study were age, race, sex, educational level, employment level, current marital status, marital history, number of dependents, residency of child, admissions to other psychiatric hospitals, and drug history.

The gatekeeper variables used were major problem areas, including problems with compliance with follow-up therapy and medication regimen, family psychiatric history, and highest level of functioning.

All files of patients above the age of 18 years with at least one readmission to a 255-bed inpatient psychiatric hospital in a large, urban, southwestern city were identified by data processing. The hospital is a public short-term facility and is a major teaching and research site for the University of Texas Health Science Center. The hospital patient population does not significantly differ from similar urban public facilities in Texas in regard to race, sex, age, and marital status (Texas Department of Mental Health and Mental Retardation, personal communication, 1991). Patient files were reviewed by a research assistant who identified the study variables. The research assistant was a master's student with extensive experience with psychiatric patients. The research assistant was trained by the author, and only one research assistant was used to collect data to insure consistency of data collection. The research assistant assessed a problem area as present based on its inclusion in treatment plans and/or progress notes. It should be noted that the absence of a treatment plan or progress notes in a particular problem area does not ensure that a problem was not present. Whereas charts in public institutions are often notoriously incomplete, this institution, as noted earlier, is a teaching and research site and, consequently, the charting was probably more complete and accurate than in most similar facilities. However, this remains a limitation of the study.

Of the variables examined in this study, only six (child residence, follow-up treatment, sexual problems, impulse control problems, sleep problems, and work problems) had more than 15 missing data points. To compare the readmission subjects with the nonreadmission subjects, patients who were admitted during the first quarter of the study year and who had no readmission to the hospital were identified and their files reviewed by the research assistant.

Of all admissions during the first year, there were 233 patients with readmissions to the hospital. Of all patients admitted during the first 4 months of the first year of operation, only 83 patients had no readmissions to the hospital during the following 8 months. Due to the socioeconomic levels of the patient population and the nature of the illness, follow-up recidivism studies are extremely difficult.

Approximately 97% of patients in the facility study are classified as indigent, with 3% having third-party payment. The institution in which this study was conducted is the only county facility in the area; therefore, patients (97%) who would seek readmission would be admitted back to the same

facility. Consequently, there is validity in the assumption that patients in the nonreadmission group were not rehospitalized elsewhere.

The sample for this study consisted of the above 233 patients with readmissions and the 83 patients with no readmissions. All participants were predominantly White, male, and single with no children and had an 8th- to 11th-grade or higher educational level and an average IQ level, as determined by hospital psychologists using standardized tests of intelligence. However, data revealed that in cases where patients did have children, those children predominantly lived with someone other than the patient. The patient's residence was predominantly with his or her mother.

RESULTS

What pathway and gatekeeper variables are descriptive of psychiatric inpatients who experienced readmission to a specific inpatient psychiatric hospital?

Race was fairly equally distributed between White (44.6%) and Black (43.3%). The majority of subjects were single (62.6%) and male (53.6%). Subjects generally had an 8th- to 11th-grade education (32.7%), an average IQ level (59.2%), and were in the unskilled work level (49%). The majority (62%) of subjects in the readmission sample had no children. However, of those subjects with children, the children did not live with the subject in 69.7% of the cases. In 23.3% of the cases, the subjects lived with their mothers. The majority (54.9%) of the subjects reported no evidence of personal drug or alcohol abuse. However, a family history of drug and alcohol abuse was reported in 25.2% of the cases. The majority of the subjects' files with readmissions provided *no* evidence of major problems in the following areas: marital (90.5%), financial (80.6%), work (75.4%), sexual (90.5%), impulse control (93.5%), alcohol (77.6%), drugs (74.6%), sleep (89.7%), and CNS (98.7%). Areas where major problems *were* noted included social (64.6%) and antisocial (57.8%). The majority of files provided evidence of compliance with medication orders (62.9%) and treatment (81.2%). Of the subjects with readmissions, 84.4% were classified as involuntary admissions, and 74.5% were discharged to home and seen for follow-up treatment within 7 days of discharge.

What are the pathway and gatekeeper variables descriptive of psychiatric inpatients who did not experience readmissions to a specific inpatient psychiatric hospital?

Subjects with no readmissions to the hospital were predominantly White (49.4%), male (53%), and single (47.6%). The subjects generally had a 12th-grade education level (32.3%), were of average intelligence (37.5%), and were employed in unskilled positions (32.8%). The majority of subjects reported no divorces (68.8%) and no children (43.8%). However, of those subjects with children, the children were most likely living with the subject (58.1%). In 16.7% of the cases, the subjects were living with their mothers. The majority of subjects (65.4%) reported no history of personal drug/alcohol abuse. However, a family history of drug or alcohol abuse was noted in 40% of the cases. The majority of the subjects' files provided evidence of problems in the following areas: financial (91.6%), social (91.5%), work (83.3%), sexual (85.7%), and impulse control (74.4%). The majority of the subjects' files provided no evidence of problems in the following areas: marital (58.9%), antisocial (52.5%), sleep (74.2%), CNS (87.9%), alcohol (69.5%), and drugs (75.3%). The majority of subjects were involuntary admissions (77.1%), were discharged to home (67.9%), and were seen for follow-up within 7 days of discharge (61%).

What are the differences in pathway and gatekeeper variables between psychiatric inpatients who did and did not experience readmission?

The sample was divided into two dichotomous groups for chi-square analyses. These groups were subjects with no readmissions and subjects with readmissions. A significance level of .05 was used for the analysis.

Subjects with readmissions differed significantly with regard to race, marital status, marital history, number of children, living status of children, other admissions, evidence of marital, interpersonal social, financial, antisocial, work, sexual, impulse control, sleep, and CNS problems, and compliance with medical and treatment regimen (see Table 1).

Subjects with no readmissions were more frequently White and married or divorced. Subjects with multiple admissions were more frequently Black and single, separated, or widowed. Subjects with no readmissions more frequently had children who were living with them than did subjects with multiple admissions. Subjects with no readmissions more frequently lived with their husbands or wives, whereas patients with multiple admissions more frequently lived with a parent or in a halfway house. Subjects with no readmissions more frequently provided data indicating marital, financial, interpersonal, work, sexual, impulse control, sleep, and CNS problems than did patients with multiple admissions. Subjects with no readmissions more frequently provided evidence of compliance with the medication and treatment regimen.

What are the pathway and gatekeeper variables most predictive of psychiatric inpatients who experience readmissions?

TABLE 1: Chi-Square Analysis of Pathway and Gatekeeper Variables Between Readmission and Nonreadmission Subjects

<i>Variable</i>	<i>df</i>	χ^2	<i>p</i>
Race	4	18.641	.001
Marital status	4	12.390	.015
Marital history	4	17.046	.002
Number of children	3	11.555	.009
Residency of children	7	22.352	.002
Other admissions	4	9.985	.041
Problems			
Marital	1	37.371	.000
Financial	1	113.710	.000
Social	1	19.987	.000
Work	1	72.251	.000
Sexual	1	41.178	.000
Impulse control	1	93.857	.000
Sleep	1	8.406	.004
Medical	1	4.832	.028
CNS	1	16.014	.000
Compliance with medication	1	20.683	.000
Compliance with treatment	1	9.641	.002

A log linear model using the logit method was developed to distinguish those pathway and gatekeeper variables predictive of multiple admissions relative to those associated with only one admission. A multilevel model allows for the simultaneous control of all variables. The dependent variable of admissions to the hospital was dichotomized into two categories: 1 representing only one admission (no readmissions within 8 months) and 0 representing two to four admissions to the facility. From the 11 pathway variables (age, sex, race, education, marital history, marital status, number of children, child's residence, work level, admission to other psychiatric hospitals, and drug history), a multilevel log linear model was developed.

Following a number of backward eliminations of nonsignificant variables, a final model comprising child's residence, sex, and previous admissions was developed. A test for interaction (likelihood ratio $p = .43$) among these three variables was nonsignificant (see Table 2). Because the likelihood ratio was nonsignificant, a power analysis for the alternate hypothesis of significant two-way interactions was conducted. The alternate hypothesis, which included all possible two-way interactions for the three variables, was tested. This generated six power functions, respectively. Table 3 presents the respective power functions. Because none of the power functions were significant, the alternative hypothesis for interactional effect was rejected.

TABLE 2: Multivariate Analysis: Log Linear Final Model

	df	G ²	p
Pathway variables			
Sex	1	5.53	.02
Child's residence	1	6.94	.01
Admissions to other psychiatric hospitals	4	10.85	.03
Likelihood ratio	12	12.19	.43
Gatekeeper variables			
Financial problems	1	5.45	.0195
Sexual problems	1	9.16	.0025
Impulse control problems	1	8.94	.0028
Likelihood ratio	4	17.79	.0014

TABLE 3: Power Functions for Alternate Hypotheses of Interaction

<i>Alternate Hypothesis</i>	<i>Power Function</i>
Sex × Previous Hospitalization	0.30
Child Residence × Previous Hospitalization	0.20
Sex × Child Residence + Sex × Previous Hospitalization	0.28
Sex × Child Residence + Child Residence × Previous Hospitalization	0.18
(Sex × Previous Hospitalization) ik + (Child Residence × Previous Hospitalization) jk + e	0.38
(Sex × Child Residence) ij + (Sex × Previous Hospitalization) ik + (Child Residence × Previous Hospitalizations) jk + e	0.36

NOTE: Based on the power analysis, the null hypothesis for no interaction effect was accepted.

The same procedure was used for the gatekeeper variables. The final model comprised financial, sexual, and impulse control problems (see Table 2). The likelihood ratio was significant, indicating an interaction effect among the variables.

Being female, having previous admissions to other hospitals, having the child live with someone other than the patient, and denial of financial, sexual, or impulse control problems were characteristics most predictive of readmission. Interestingly, Gruber (1982) also found that females and those with fewer dependents were likely to be readmitted.

DISCUSSION

Pathway variables that differed between patients with no readmission and those with readmission appeared to reflect the patient's family support and functional level. Patients who were married or divorced were more likely to have no readmissions, whereas patients with readmissions were more likely to be single, separated, or widowed. These findings are in keeping with the earlier noted studies by Hanson and Babingian (1974), Horowitz (1977), and Richart and Millner (1968).

Patients who are married possibly have more family support or a more stable home environment. Supporting this hypothesis is the finding that patients with no readmissions were more likely to be discharged and return home to their spouse, whereas patients with a readmission were more likely to be discharged to halfway homes or to live with their parent(s). This possibly also reflects the ability of the patient to function in terms of activities of daily living and to function at an adequate interpersonal level. Supporting this line of reasoning is the finding that patients with no readmissions had more children and their children were more frequently living with them. Patients with children usually have more responsibility and accountability for the well-being of others; consequently, there may be more motivation to use therapy and comply with treatment regimens to regain their functional abilities. Patients with no readmissions were more likely to be discharged without medication, thereby reflecting a higher level of ego organization and function.

Key gatekeeper variables that differed between patients with no readmissions and those with readmissions were evidence of marital, financial, social, work, sexual, antisocial, impulse control, and CNS problems. One would have anticipated that patients with readmissions would more frequently have documented evidence of these problems than would patients with no readmissions. However, the reverse was true. Patients with evidence of problems in the above areas were more likely to be in the nonreadmission group. The above finding reflects either the level of awareness of problematic areas and/or symptoms in need of treatment, and/or the motivational level of the patient, both of which are indicative of a high level of functioning. Patients with increased awareness of problems were more frequently in the nonreadmission group. Apparently, there is a direct relationship between the denial of problems and the frequency of readmission. Although evidence of problems in the above areas reflected a comprehensive review of the files, including intakes, social histories, psychological and mental status evaluations, and nursing notes/care plans, and so forth, patients with major psychological dysfunction (i.e., patients with diagnoses of schizophrenia, etc.) did

not have notations of social problems, impulse control problems, or others. Perhaps as the patient becomes increasingly verbal about problematic areas, he or she is likewise increasingly likely to engage the treatment staff (i.e., student assignment), which consequently leads to more opportunities for therapeutic intervention and problem solving. This engagement in the therapeutic process possibly provides the necessary linkage for continued outpatient therapy. Apparently, both the identification of problem areas by the professionals and therapy focused on helping the patient to identify these problem areas and the impact on their life may be a realistic short-term goal that could have long-term benefits in terms of recidivism (Yalom, 1983). This type of intervention is in keeping with the psychoeducative model (Miller, 1989; Williams, 1989). According to Miller (1989), one of the educative modules focuses on coping skills training. In this module, the patient develops an awareness of life stress and significant life events and identifies effective methods for coping with these problems.

In assessments of risk for recidivism, patients who are female with a history of previous admissions, whose children reside with someone else, and who deny financial, sexual, and impulse control problems should be targeted for both intensive problem awareness identification focus groups and/or psychoeducative groups while in the hospital and follow-up services for a minimum of 3 to 6 months following discharge.

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Commentary by Whall

This is an important study for several reasons: First, the linkage of present recidivism studies with earlier efforts is needed—many of the earlier studies did not address control issues as well as the present study did; second, as psychiatric mental health nursing graduate programs continue to decrease in number, the number of studies in the area of chronic mental illness may decrease; and, third, this research suggests one relatively inexpensive method for using chart review to examine changes in recidivism rates over time. As with all chart review methods, the quality of the data depend on the quality of the record keeping. As this study took place within a hospital affiliated with a university, the record keeping is probably more complete. Nevertheless, those at hospitals not so associated may find the study helpful in terms of suggesting the needed data for replication. The authors are clearly aware of several other limitations, but given the realities of funding, chart reviews may be one of the more viable options for those wishing to assist the chronically mentally ill.

There is, as the authors suggest, a legacy of at least 25 years of recidivism studies. This study is related to the more recent work of Gruber (1982). Nevertheless, there are several rival hypotheses from the past that could be used to interpret one or two findings from this study. But first, among several findings from this study that have rather good support from the past are that those with less education and less family supports tend to be rehospitalized more often and that being female is more predictive

of rehospitalization than not. This latter finding has been a topic in sex role stereotyping for some time (Spitzer & Denzin, 1968). As an aside, an intervening variable in most recidivism studies is public policy, for if general assistance is cut off from unskilled workers who have exhausted unemployment benefits, the mental hospital may be an alternative to homelessness. It would, therefore, be good to know if there were any public policy changes over time and how these might have affected recidivism rates.

In terms of rival hypotheses, in the Discussion section the authors state that patients with increased awareness were more often in the nonreadmission group and that those without such awareness/denial of problems were more often in the readmission group. Scheff (1975) and Perucci (1974) conducted and reviewed several studies and came to this same conclusion, although their interpretation was different. These latter researchers interpreted this to mean that those who agreed with mental health professionals that they indeed were not mentally healthy were seen by the professionals as being more mentally healthy than those who resisted the label. Scheff and Perucci as medical sociologists took this as evidence that playing the role and making mental health professionals feel that their diagnosis was correct was a large part of escaping the recidivistic cycle. Whether this interpretation still holds in a time of closure of more and more mental hospitals would be an interesting aspect of future recidivism studies. Nevertheless, the present study makes its contribution by updating past recidivistic findings and demonstrating that some still hold in this new era.

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Response by Polk-Walker

As the reviewer points out, chart reviews are a relatively inexpensive method of examining changes in recidivism rates. However, as noted by the reviewer, caution must be taken in both the gathering of data and its interpretation. Any researcher

undertaking this type of study needs to control the quality of data, which will vary based on the recording procedures of the hospital. Consequently, the researcher will need to identify not only which variables are essential for examination but the accuracy and consistency of their reporting in the chart. Once it is determined to examine certain variables, then procedures for determining the reliability of data over time and among different raters must be considered. This study attempted to control for as many threats to reliability as possible.

Because the institution used in this study was a teaching hospital, charts possibly contained more in-depth information, accuracy, and consistency than found in the reporting of information in nonteaching facilities. In addition, the researchers were able to use only one research assistant, thus eliminating the problem of differences in reporting due to multiple data gatherers. However, it is important to note that as more controls are used, the cost of the study may increase, which may become problematic in this era of cost constraints in hospitals. I do not believe this should prevent hospitals and nurse researchers from using this type of approach. Well-developed protocols with good interrater reliabilities, which are validated periodically over the duration of the study, would allow a group of nurses to undertake this type of study without unduly financially burdening the institution. It should also be pointed out that any study that would help in the development of effective interventions to decrease rehospitalization would more than pay for itself.

As noted by the reviewer, findings of this study are supported by previous research in regard to education, family support, and sex. I agree with the reviewer that social policy (at both the national and local level) is a possible intervening variable. Regarding this factor, I know of no social policy changes in relation to admissions on the local level during the period of this study.

Scheff (1975) and Perucci (1974), while arriving at similar findings, did interpret the findings differently. The difference in interpretation illustrates one of the limitations of this type of descriptive retrospective study. These studies identify possible linkages in constructs. They are intended to highlight or call to the attention of clinicians and researchers possible variables or factors that are related to the variable under investigation (in this case, recidivism). This is a first step.

The next step would be to develop interventions based on these findings and to test their effectiveness in decreasing recidivism rates. It would be of value to select a group of patients controlling for sex, socioeconomic level, and family support, establish baseline awareness level, and randomly assign the subjects to either a problem identification group, as described in the study, or a control group who received routine hospital care. Pre- and postawareness levels would be obtained and the groups followed for a period of time to examine recidivism rates. Far too often, nurses and other health care providers/researchers fail to take the descriptive findings of studies to this next step, which is necessary to establish the clinical effectiveness of interventions. It may be of interest that one nurse at the institution where this study was conducted is implementing a clinical intervention study similar to the one described above.

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