



Disparities in Health Coverage Across Gender and Marital Status among Discharged Psychiatric Patients

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Abstract

The goal of this study was to examine the demographics sex and marital status of inpatients with schizophrenia and bipolar and compare differences in patients' chances of possessing adequate health coverage to cover hospital expenses. Data from the National Hospital Discharge Survey was extracted and analyzed. For hospital discharges of patients age 18 and older 702,626 hospital discharges were included in the study representing a weighted population of 77,082,738 hospital discharges. *Prediction model was applied to test the ability of the independent variables sex and marital status to predict differences in health coverage in multinomial logistic regression (MLR) test.* Results indicate that sex and marital status were significant predictors of health coverage type that patient owned. Male, unmarried and with unknown marital status patients were more likely to be either uninsured or publicly insured. Public health policy legislation efforts need to address public-health-insurance provisions that limit the coverage of treatment for psychiatric patients.

Keywords Public health insurance provisions · National hospital discharge survey · Schizophrenia and bipolar patients · Marital status · Male and female patients

Introduction

Hospital inpatients with serious mental illness (SMI) is often time unnoticed group of patients in general hospitals that became increasingly substantial since the massive deinstitutionalization of psychiatric inpatients from psychiatric hospitals in the 1960s. From 1964 to 2009 the number of SMI patients in general hospitals increased from 150,000 psychiatric patients to two million patients [1, 2]. The dramatic increase was due to several reasons, including the enactment of the Community Mental Health Act in 1963, the creation of Medicaid in 1965,

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and the failure of the state to provide aftercare for psychiatric patients once they were discharged from state psychiatric hospitals [1–3].

Persons with SMI tolerate financial, societal, and emotional burden associated with hospital treatment, medication, and comorbidities, which decrease patients' quality of life [4–6]. Research has shown insured persons with mental disorders are more likely to utilize the health care sector [7], whereas publicly insured and uninsured persons tend to use outpatient, specialized mental health care, or to seek human services or alternative/complementary medicine [8]. However, evidence remains scant about whether demographic correlates could predict their chances for possession of health coverage, or not. The primary objective of the current study is to compare differences in health coverage among discharged inpatients diagnosed with schizophrenia and bipolar, and to examine if sex and marital status can predict differences in health coverage type used by the patients. It is hypothesized that sex and marital status of the patients will predict the type of health insurance they used to cover treatment expenses in short-term general hospitals. More specifically, it is predicted that male inpatients are more likely than female inpatients to be uninsured and to use public health insurance, whereas married inpatients are more likely to be privately insured, compared to single, divorced, separated, widowed, or inpatients with unknown marital status.

Methods

Data Sources

In this observational research design, the author obtained and analyzed data from the National Hospital Discharge Survey (NHDS) of the National Center for Health Statistics. The NHDS is a two-stage stratified sample design. Hospitals are stratified according to bed size and geographic region. Sample hospitals are selected, with probabilities ranging from certainty for the largest hospitals to one in 40 for the smallest hospitals [9]. The NHDS provides a record for each hospital discharge, and patients can be included more than once if they have more than one discharge during the sampling period and if the discharge is captured by the sampling methods. Accordingly, hospital discharge, and not individual patients, is the sampling unit used in the study.

The NHDS morbidity survey enables users to produce national and regional estimates of demographic characteristics, health insurance coverage types, bed sizes, admission types, admission sources, ownership and geographic regions of hospitals, surgical and non-surgical procedures, and up to seven diagnoses patients receive in non-federal short-term general hospitals (<https://www.cdc.gov/nchs/nhds/index.htm>). Public-use data and documentation from the NHDS 2005 and 2007 survey years were used in this study.

The total size (N) of the study population was 702,626 hospital discharges. 327,254 discharges in 2005 and 375,372 in 2007. The weighted size of the study population was 77,082,738 hospital discharges. Study subjects were individuals who met the following criteria: (a) 18 years or older with a hospital discharge record, and (b) possessing a primary diagnosis record of schizophrenia, psychotic disorder, or bipolar disorder (coded according to the International Classification of Diseases, 9th revision Clinical Modification (ICD-9-CM) coding criteria) (weighted $N=1,681,611$) [10]. The NHDS data is publicly available and contain no identifying information regarding patients; hence, there was no risk of disclosure or violation of patient privacy, and no need for informed consent. Because the study used public

use data, the Institutional Review Board considers the study an exempt study. All study procedures were approved by the appropriate institutional review board.

Statistical Analyses

This study used a secondary data analysis to analyze national hospital discharge records of individuals with primary diagnoses of schizophrenia and other psychotic disorders (ICD-9-CM codes 295.0–295.9) or bipolar disorders (ICD-9-CM codes 296.0–296.9). Those records were coded “1” while all others were coded “0.” Sex and marital status were independent variables, and health insurance coverage was the primary outcome measure in the study. Health insurance coverage represents the primary source of payment used by the patient [9]. The marital status variable included three groups (married, single, and other (which included divorced, separated, widowers, and unknown)). Because some of the original NHDS categories had very few observations (less than 5%), which is insufficient for producing meaningful, interpretable results [11], all forms of health coverage were categorized into three main groups (private health insurance, public health insurance, and uninsured).

As NHDS was a national survey that used multistage stratified sampling, the variable “weight” that represents probability weights (p weights) was applied to the statistical analyses to account for the sampling method used in data collection, to ensure accurate point estimation regarding the standard errors, and to allow the results of the analyses to be generalized to the entire U.S population [9]. Unweighted and weighted estimates of sex and marital status characteristics of the target patients were analyzed to produce national estimates of these demographic variables for patients. To examine the research hypotheses, weighted multinomial logistic regression (MLR) analysis was used to examine if sex and marital status are significant predictors of health coverage type of discharged patients with schizophrenia or bipolar. MLR is a prediction test of likelihood odds that indicates the chances of one event occurring in comparison to other events [12]. The objective of the study was to assess if sex and marital status are significant predictors of health coverage type, which is a categorical variable. Thus, MLR analysis is the appropriate statistical model for estimating the probabilities of different health insurance types. The model fit was examined using Pearson and deviance criteria and the display of statistics that measure the overall model performance was controlled. Wald Statistics, changes in log likelihood, and odds ratios for prediction of health insurance coverage were also calculated.

Results

In total 702,626 hospital discharges were included in this study, representing a weighted total of 77,082,738 discharged patients. Of these, there were 16,597 schizophrenia and bipolar-disorder-related hospital discharge records, representing a weighted total of 1,681,611.

Table 1 displays marital status characteristics of the discharged patients with a primary diagnosis of schizophrenia or bipolar disorder. Of these, the majority were either divorced, separated, widowed, or unknown; while 40.6% were either single or married.

Table 2 shows that two third of married inpatients with schizophrenia and bipolar disorder were female. It also shows that females were the majority among patients who were divorced, separated, widowed, or didn't report their marital status. A chi-square test indicated significant sex distribution differences across marital status groups ($p < 0.001$).

Table 1 Marital status characteristic of discharged inpatients with a primary diagnosis of schizophrenia or bipolar disorder

Marital status	Unweighted N	Weighted N	Weighted %
Single	3173	491,141	29.2
Married	1,172	1,921,07	11.4
Other	12,252	998,363	59.4
Total	16,597	1,681,611	100.0

Data from the National Hospital Discharge Survey (2005 and 2007) for hospital discharges aged 18 and older

Multinomial Logistic Regression Analyses

To measure the likelihood ratios of patients possessing a health insurance coverage, MLR analyses were conducted for sex and marital status, respectively. The results of model fitting of the MLR confirms that sex and marital status are significant predictors of health insurance coverage used by discharged inpatients with schizophrenia or bipolar, demonstrating a substantially better fit than the intercept only model ($p < 0.05$) (Table 3).

The estimated coefficients indicate that male patients were more likely to be publicly insured or to be uninsured than female patients (Exp (B) = 1.33 for males with public health insurance, and Exp (B) = 1.43 for male uninsured patients; $p < 0.05$) (Table 4). About marital status predicting the type of health insurance coverage, different directions were detected for publicly insured and uninsured patients, indicating that different likelihoods for health coverage exist among patients with different marital statuses. Married patients were less likely to have public health insurance or to be uninsured than to have private health insurance, whereas inpatients with other marital status were more likely to be uninsured or to be publicly insured, than to have private health insurance (Exp (B) = 0.38, Exp (B) = 1.27 for publicly insured married and other marital statuses; Exp (B) = 0.50, Exp (B) = 2.31 for uninsured married and other marital status; $p < 0.05$) (Table 4). In summary, chances to have health insurance coverage among schizophrenia and bipolar inpatients are significantly impacted by patients' sex and marital status. Female and married inpatients have better chances to have private health insurance than male, unmarried patients, and patients with unknown marital status.

Table 2 Male and female discharged inpatients with a primary diagnosis of schizophrenia or bipolar disorder in terms of marital status

Marital status	Married		Single		Other		<i>p</i> value
	Weighted N	Weighted (%) ^a	Weighted N	Weighted (%) ^a	Weighted N	Weighted (%)	
Sex							<0.001
Male	76,773	40.0	437,681	43.8	288,871	58.8	
Female	115,334	60.0	560,682	56.2	202,270	41.2	
	192,107	100.0	998,363	100.0	491,141	100.0	

Author's analysis of data obtained from the National Hospital Discharge Survey (2005 and 2007)

^a Weighted to estimate proportions of schizophrenia and bipolar patients from all discharged patients included in the National Hospital Discharge Survey (2005 and 2007)

Table 3 Tests of the model effects of sex and marital status predicting the health-insurance coverage of discharged schizophrenia and bipolar patients^a

Source	df	Wald chi-square	Sig.
Corrected model	6.000	221.084	.000
Intercept	2.000	865.656	.000
Sex	2.000	18.666	.000
Marital status	4.000	197.928	.000

^a Author’s analysis of data from the National Hospital Discharge Survey (2005 and 2007)

Discussion

To the best of the author’s knowledge, this is the first study to use national data to predict health insurance coverage used by hospital psychiatric inpatients across sex and marital status. The results suggested that disparities in health coverage exist among inpatients with schizophrenia and bipolar, with female and married inpatients having higher chances to have a private health insurance than male and unmarried patients (single, widowed, divorced, and unknown marital status). Further, the latter group of patients may have a higher risk of relapse and exacerbated symptoms, as they are less likely to be able to afford hospital treatment.

Male and unmarried patients tended to be either uninsured or publicly insured, possibly indicating less social and economic security and hindering their ability to afford health insurance. These results accord with earlier study results that examined estimates of health coverage among noninstitutionalized persons with schizophrenia and found that many individuals with schizophrenia received public health insurance, yet a sizable minority remained uninsured [13]. The results of the current study however also found that patients have unequal

Table 4 Parameter estimates table for the health insurance coverage for schizophrenia and bipolar patients predicted by sex and marital status^a

Health insurance coverage ^b	Parameter	B	Std. error	95% confidence interval		Hypothesis test			Exp (B)	95% confidence interval for Exp(B)	
				Lower	Upper	T	df	Sig. ^d		Lower	Upper
Public insurance	(Intercept)	1.01	.09	.82	1.20	10.38	733,855.00	.000	2.76	2.28	3.35
	Male	.28	.07	.14	.43	4.04	733,855.00	.000	1.33	1.16	1.53
	Female	.00 ^c	.	.	.	.	.	.	1.00	.	.
	Married	-.96	.12	-1.21	-.72	-7.72	733,855.00	.000	.38	.29	.48
	Other	.24	.09	.06	.42	2.68	733,855.00	.007	1.27	1.06	1.52
	Single	.00 ^c	.	.	.	.	.	.	1.00	.	.
Uninsured	(Intercept)	-.98	.14	-1.27	-.70	-6.72	733,855.00	.000	.37	.27	.49
	Male	.35	.09	.16	.55	3.61	733,855.00	.000	1.43	1.17	1.73
	Female	.00 ^c	.	.	.	.	.	.	1.00	.	.
	Married	-.67	.22	-1.12	-.23	-3.00	733,855.00	.003	.50	.32	.78
	Other	.83	.13	.57	1.10	6.21	733,855.00	.000	2.31	1.77	3.01
	Single	0.00 ^c	.	.	.	.	.	.	1.00	.	.

^a Author’s analysis of data from the National Hospital Discharge Survey (2005 and 2007)

^b The reference category is private health insurance

^c Set to zero because this parameter is redundant

^d Significance level $p < 0.05$

chances for owning health insurance, depending on patient's sex and marital status and the type of health insurance in question.

Utilization of public health insurance is not a choice patient makes, and several embodied inequalities in public health insurances impact the availability of timely treatment for patients with SMI. According to the Medicare provision regarding inpatient mental health care, Medicare covers mental health services for any duration of time in general hospitals *only*. Further, Medicare only covers up to 190 days of treatment in a psychiatric hospital over a patient's lifetime [14]. Admission to a psychiatric hospital is sometimes necessary, and freestanding psychiatric hospitals are staffed with medical and mental health professionals who provide a continuum of psychiatric care that may not be available in general hospitals [2, 15]. However, as a result of the limitations Medicare places on the type of hospital providing treatment, patients with Medicare coverage have limited options when hospital admission is necessary. Another source of inequality in public health coverage concerns Medicaid provisions, the Medicaid Institutions for Mental Diseases (IMD) exclusion, that excludes health insurance coverage for patients aged 21–64 who are admitted to free-standing psychiatric hospitals [2, 15]. This exclusion hinders the most vulnerable patients, increasing the need for psychiatric hospitals [16]. The reason for this exclusion is that the federal government was seeking to encourage the use of outpatient community mental-health services that, over time, with development of better psychotropic medications and increases in the numbers of psychiatric beds in general hospitals, would replace state psychiatric hospitals. Further, the Medicaid programs offered by the state are often covered by the same provider networks that cover individuals enrolled in private health insurance. The facilities the provider networks offer include facilities that Medicaid considers institutions excluded from coverage [17]. Hence, the exclusion policy creates inequality between Medicaid patients and privately insured patients in access to certain mental health services, increasing the chances for psychiatric admission of Medicaid patients in general hospitals. However, on November 13th, 2018 mental health treatment options expanded under changes to Medicaid IMD exclusion that were announced by the U.S Department of Health and Human Services. Under the recently announced Medicaid program states will be eligible to apply for Medicaid reimbursement for psychiatric care provided in treatment facilities with more than 16 beds. This very recent change to IMD exclusion law may facilitate the admission of more psychiatric patients to free standing psychiatric facilities [14]. However, the short and long term outcomes of the new Medicaid program and its impact on psychiatric patients are yet to be witnessed. The current study also found that female and married patients have better chances to own private health insurance, thus better chances to access specialized psychiatric hospitals if needed, whereas male and unmarried patients tend to be uninsured or publicly insured, thus, to be in disadvantage and specialized psychiatric hospitals might be unavailable to them. The study also showed that most male patients were single (58.8% males; 41.2% females). These results align with earlier results about hospital discharges that found that 62.7% of female inpatients with SMI were married, but only 37.3% of male patients were [18]. There are several potential explanations for this finding. First, female patients may be more prone to utilize marriage as a buffer against economic hardship, which may explain the higher percentage of married female patients and the privately insured female patients. Previous research results suggest that females are more cautious and less risk taking than males [2]. Thus, females might be more likely to seek private health insurance to secure social welfare. Second, private health insurance may become available for female patients through their spouses' employer, which they can receive as a dependents [19]. Therefore, marriage may

provide female patients with emotional and financial support, which could make hospital treatment more affordable for them. Concurrently, in the “other marital status” group among patients the rate of females was higher than males. This finding might appear surprising, but there are several possible explanations. First, males have a higher risk of dying in both childhood and adulthood [20]. Thus, female patients possibly appear as a majority group because they are more likely to live longer. A second plausible explanation is that female patients may be more willing to seek hospital admission. This tendency aligns with the abovementioned finding that females are more cautious and less risk taking. According to the World Health Organization, females are more likely to seek mental health services, whereas males do so only at a later stage, after symptoms become serious [10]. Further, how each sex utilizes socio-emotional skills to address illness and utilize treatment opportunities impacts the motivation to seek hospital treatment.

Patients’ sex and marital status were confirmed as significant predictors of unequal chances for health coverage among study subjects. This raises serious concerns about mental health equity and access to adequate hospital treatment for all patients. SMIs impact patients regardless of sex or marital status, and appropriate treatment should be provided. This disparity in health insurance coverage is legally institutionalized in existing health care provisions, which create limited access to mental health services for the neediest patients. However, the above proposed explanations are potential explanations only to the unequal chances in access to health insurance among hospital patients with schizophrenia and bipolar from different demographic groups.

This study has several strengths. First, to the best of the author’s knowledge, it is the first study to examine sex and marital status to predict differences in health coverage type among hospital patients diagnosed with schizophrenia and bipolar. Second, it used big data that integrates health information from millions of hospital patients. Such access and analysis of big data can improve inpatients’ mental health care access and can inform hospital administrators regarding recruitment and organization of staff. However, the results should not be overgeneralized to other settings and populations, such as psychiatric patients in community clinics, hospital outpatient clinics, Veteran Affairs and prison hospitals, or patients with other illnesses. There were also several limitations that may merit future investigation. First, the study covered general hospitals with and without psychiatric units, patients in scattered beds in general hospitals, and hospitals with and without free-standing psychiatric facilities. Hence, the study does not make a clear distinction between the different types of inpatient care facilities. Second, the survey examines retrospective hospital discharge records for patient episodes, and patients may have been counted more than once if they were readmitted during the sampling period and if the discharge was captured using the sampling method. Consequently, the author was unable to examine readmission rates for patients since the data were based on hospital discharges and not on individuals. Third, because the study used an MLR model, it is difficult to explain differences or draw definite conclusions regarding the source of differences between the outcomes found to be significant. Finally, the measurement of the study variables was categorical, including nominal and ordinal measurements, which limited the ability to observe linear changes in the outcomes.

Sex and marital status significantly predicted health coverage of patients with schizophrenia and bipolar in general hospitals, suggesting disparities may have a cumulative impact on access to hospital treatment among them. Most psychiatric patients use public health insurance, which has discriminatory policy provisions directed against them as patients. Results concerning the inequality among psychiatric patients to receive health coverage can inform

health policy makers on improvement of health insurance policies that minimize such inequalities. Study results can also inform practitioners about at-risk populations who are likely not to own health insurance or to own public health insurance with limitations and exclusions in their treatment options. Such individuals can be targeted using community outreach efforts prior to their hospital admission. It takes time to overcome disparities in mental health treatment. The reshaping of mental health services is the duty of mental health professionals and will be bequeathed to the next generation who will be tasked with advocating for quality mental health services for the greater good, and for a more inclusive, tolerant, healthier, and moral society.

Compliance with Ethical Standards

Conflict of Interest Author Aren Omary declares that she has no conflict of interest.

Ethical Approval This article does not contain any studies with human participants or animals performed by any of the authors.

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