

An Evaluation of Racial and Ethnic Health Differences in State Mental Health Inpatient Services: 2002–2005 Versus 2010–2011

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Abstract

This study analyzed racial-ethnic differences previously documented in the Connecticut Department of Mental Health and Addiction Services mental health inpatient system across two time periods (2002–2005 and 2010–2011). Comparisons of logistic regression analyses from the two time periods showed that, at time 1, significant racial-ethnic differences were found for referral by other sources (e.g., outpatient), length of stay, discharge against medical advice, and some diagnostic differences (e.g., schizophrenia, other psychotic disorders, cluster B discharge diagnosis), but these differences were not significant at time 2. Other diagnostic differences remained significant at time 2 (e.g., mood disorders, substance use disorders, other axis I disorders, mental retardation) as well as racial-ethnic differences in self-referral. These results suggest that the multiple national and state cultural competence initiatives between time 1 and time

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Journal of Behavioral Health Services & Research, 2016. 242–262. © 2016 National Council for Behavioral Health. DOI 10.1007/s11414-016-9539-2

2 could have resulted in decreases in racial-ethnic differences. Targeted interventions to alleviate the remaining differences are needed.

Introduction

Racial and ethnic minority groups have been shown to have less access to mental health services, be less likely to receive mental health care, and receive poorer quality of care when they do receive it.¹⁻³ Racial and ethnic minorities are even found to have a lower quality of care when variables related to access such as insurance and income are controlled.⁴ Additionally, research examining physical health care has shown that racial and ethnic differences are increasing.¹ The causes of these well documented differences are complex and likely involve the intersection between many layers of care such as overall mental health systems, policies, administration, and health care providers.⁴ Improving the cultural competence of care has been shown to improve outcomes, although further investigation of culturally competent care and its outcomes are highly needed.³ This paper investigates changes in racial-ethnic differences in access, treatment-related variables, and diagnosis at two time periods within a behavioral healthcare system that has received multiple national and state interventions related to cultural competence and health disparities.

Studies of mental health differences

Treatment-related variables

African-Americans have been found to be more likely to be referred to mental health treatment by social services or the criminal justice system than other racial-ethnic groups regardless of socioeconomic background.^{5, 6} Moreover, in low-poverty areas of New York City, African-Americans were less likely to self-refer to mental health services than White Americans.⁷ Additionally, a study of public sector outpatient mental health services in New York found that treatment prevalence was greater for both African-Americans and Hispanic Americans than Whites.⁸ The authors suggested that this finding occurred because Whites tended to seek private-sector care more than public-sector care. As for Hispanic Americans, when compared with non-Hispanic White Americans, Hispanic Americans with psychosis were more likely to receive emergency services and Hispanic Americans with anxiety disorders were less likely to receive mental health services. Hispanic Americans have also been found to be less likely to use community support services than other racial-ethnic groups⁷ and to under-utilize primary care behavioral health and specialty health care.⁹ Hispanic Americans were also more likely to leave substance abuse treatment earlier than other racial-ethnic groups.¹⁰

Diagnosis

There have been a number of recent studies that continue to show that there are racial and ethnic differences in the diagnosis of mental health disorders.^{8, 11-14} In many studies, it has been found that African-Americans were more likely to be diagnosed with schizophrenia than White Americans.^{11, 13} The increased rate of diagnosing schizophrenia among African-Americans has been additionally found when the samples analyzed clients who were civilly committed to inpatient facilities, showing that the overrepresentation of inpatient African-Americans was not simply due to increased use of services by African-Americans compared to other groups in the study.¹² Moreover, when examining both inpatient and outpatient samples, African-Americans were not more likely to be diagnosed with schizophrenia at the outpatient level, showing that African-

American's higher tendency to be diagnosed with schizophrenia at the inpatient level cannot be attributed to higher use of mental health services in general.¹² Moreover, other researchers found that, in addition to African-Americans being three times more likely to be diagnosed with schizophrenia than White Americans, the examiners that diagnosed the clients also perceived more dishonesty from the African-American clients than the White clients. When this dishonesty variable was removed, the diagnostic disparity was substantially reduced as well, showing that the disparity issue may be due to unconscious discrimination by clinicians.¹¹ Interestingly, however, a study using inpatient and outpatient data from six different US sites found that African-Americans were more likely to have a diagnosis of schizophrenia even after making interviewers blind to the race of the individuals and controlling for comorbid affective disorders.¹⁵ Other findings that take socioeconomic status into consideration have found that in low-poverty areas African-Americans are shown to have significantly higher rates of diagnosis of schizophrenia than White Americans. However, in high poverty areas, no differences in diagnosis among different racial and ethnic groups are found.⁷ Unfortunately, studies examining possible reasons behind racial-ethnic differences in the diagnosis of affective, anxiety, substance use, and personality disorders are not as common as studies examining the diagnosis of schizophrenia.

The results regarding affective disorders have been mixed. Some studies have found that African-Americans were more likely to be diagnosed with affective disorders.^{8, 12} No racial-ethnic differences in mood and anxiety disorders were found in substance abuse inpatient settings.¹⁰ In a national community survey, non-Hispanic Blacks were found to have lower lifetime risk of mood and anxiety disorders. But when looking at persistence of illness, Hispanic Americans were found to be more persistently ill with mood disorders, and non-Hispanic Blacks were found to be more persistently ill with both mood and anxiety disorders than White Americans.¹⁶ Additionally, older Hispanic Americans were more likely to be diagnosed with depression than White Americans.⁸ However, others have found that Hispanic Americans were not more likely than White Americans to be diagnosed with mood or anxiety disorders. Yet when Hispanic Americans did have mood disorders, they were more likely to have a chronic illness than White Americans with mood disorders.¹⁶

Regarding substance use, some studies suggest that Hispanic Americans and African-Americans tend to report more alcohol and/or drug abuse than White Americans.¹⁷⁻¹⁹ Moreover, African-Americans have been found to be more likely to be diagnosed with a drug-related diagnosis and Hispanic Americans with an alcohol-related diagnosis.²⁰ Hispanic Americans have been found to have a lower risk for substance use disorders than White Americans in substance abuse inpatient settings.¹⁰

Less research has examined racial-ethnic differences in personality disorders. A 2010 meta-analysis examining racial differences found that African-Americans were diagnosed less often than White Americans with personality disorders, but these differences could be due to a lower prevalence among the population.²¹ Another community sample found that African-Americans had higher prevalence of personality disorders than Whites.²² A study of inpatient substance abuse settings found that both African-Americans and Hispanics were more likely than Whites to have a cluster B personality disorder diagnosis at discharge.¹⁰ A longitudinal study of people who had received mental health services found higher rates of borderline personality disorder in Hispanic clients and higher rates of schizotypal personality disorder in African-American clients.²³

Possible explanations for bias

Differences in diagnosis and treatment among different race-ethnic groups can stem from bias at the provider, organization, or system level. With regard to providers, a 2010 study revealed that 51% of their sample of psychiatrists were either "not at all" or "a bit" familiar with racial and ethnic mental health differences.²⁴ Providers need to understand their own cultural biases and how

these biases may affect assessment and the therapeutic relationship in behavioral health services. An explanation for discrepancies in diagnosis between race/ethnic groups is that the framework with which psychiatric diagnosis takes place is mainly rooted in European American culture and values. As such, deviations from this biased norm may be easily seen as disordered behavior.²⁵ Mallinger and Lambert²⁴ conclude that psychiatrists may unconsciously be biased during diagnosis and that they may even also consciously attribute others to being biased but not themselves. Thus, this also shows a need to investigate and change clinician's unconscious biases. Aside from personal bias among clinicians, the level of bias that leads to differences in diagnosis and care among race/ethnic groups at organizational and systemic levels are relatively unknown and would greatly benefit from further examination.²⁶

The current study

This study is part of a series of studies in the Connecticut Department of Mental Health and Addiction Services (CT DMHAS) Health Disparities Initiative whose goal is to document and eliminate racial-ethnic disparities and instill cultural competence into the CT DMHAS behavioral health system. The purpose of the current study is to investigate changes over time in the significance and effect size of the association between race-ethnicity (i.e., non-Hispanic White, African-American, and non-Black Hispanic) and inpatient treatment-related factors (i.e., patterns of referral source, legal status, length of stay, discharge status) and diagnosis (i.e., type of axis I and II diagnosis at admission and discharge) among adults who received inpatient services at state-funded and governed treatment facilities. Associations were previously analyzed with data from 2002 to 2005, revealing multiple disparities in treatment-related factors and diagnosis in regard to racial-ethnic group (reference omitted for anonymity). This current study examines this association at two independent time periods (time 1: 2002–2005 and time 2: 2010–2011). It is predicted that the racial-ethnic differences that were documented at time 1 would decrease at time 2,²⁷ given the multiple national and statewide efforts to increase cultural competency of healthcare and decrease health disparities that occurred between time 1 and time 2, although a conclusion of causality is not warranted given the study design. Specifically, during time 1, multiple inequities were found in the way the racial-ethnic groups were referred to inpatient care, types of diagnoses given, and outcomes of care. African-Americans were more likely to self-refer to care, leave against medical advice, displayed greater symptom severity ratings, and had shorter length of stay at discharge, than both Hispanic Americans and White Americans. They were also less likely to be referred by other inpatient settings. It was predicted that these treatment-related disparities would decrease at time 2. In terms of diagnostic disparities, at time 1, African-Americans were more likely to receive diagnoses of schizophrenia and drug-related disorders and were less likely to be diagnosed with mood disorders than both White Americans and Hispanic Americans. African-Americans were also more likely to be discharged with a cluster B personality disorder diagnosis than Hispanic Americans. African-Americans were also more likely to be diagnosed with other axis I disorders (e.g., anxiety disorders, cognitive disorders), personality disorder NOS, and mental retardation or borderline intellectual functioning than White Americans. It was predicted that these diagnostic disparities would decrease at time 2.

Hispanic Americans were significantly less likely to self-refer to care and more likely to enter inpatient care by crisis emergency referral than both White Americans and African-Americans. Moreover, Hispanic Americans were more likely to be diagnosed with “other psychotic disorders” than White Americans. It was predicted that these treatment-related and diagnostic disparities would decrease at time 2.

Methods

This study was approved by the Yale University Human Investigation Committee and the CT DMHAS Institutional Review Board.

Participants

The data used in this research were obtained from the database of CT DMHAS clients maintained by the Information System Division and the Evaluation Quality Management and Improvement Department of CT DMHAS. At time 1, a random extract method was used to obtain a sample of 494 African-Americans, 411 non-African-American Hispanic Americans, and 478 non-Hispanic White clients discharged from CT DMHAS inpatient units from 2002 to 2005 ($N = 1383$). Time 2 analyzed the population of all African-American ($n = 291$), non-African-American Hispanic ($n = 117$), and non-Hispanic White ($n = 450$) patients discharged from CT DMHAS inpatient units during fiscal year 2010–2011 ($N = 858$).

Three racial-ethnic groups were compared in this analysis: African-Americans, Hispanic Americans, and White Americans. Patients were considered “White American” if their race was “White or Caucasian” and their ethnicity was “non-Hispanic.” Patients were considered “African-American” if their race was “Black” and their ethnicity was “non-Hispanic.” Patients were considered “Hispanic American” if their race was “White” or “Other” and their ethnicity was coded “Hispanic” which included multiple nationalities coded as “Puerto Rican,” “Mexican,” “Cuban,” and “Other.” Clients with race “Black” and ethnicity “Hispanic” were not included in this analysis so that the sample would match the time 1 sample as closely as possible which did not include this population. Clients from other races (i.e., Asians, American Indians/Native Alaskans, Native Hawaiian/other Pacific Islander) and clients coded with more than one race were not included in these analyses since their total numbers were very low in these data sets and since they were not included in the time 1 analysis.

Data analysis

The goal of this study was to investigate whether racial-ethnic differences in access and treatment-related variables decreased at time 2 given multiple national and state initiatives to increase cultural competence and decrease health disparities. To investigate this hypothesis, the same data analytic procedures were conducted at time 1 and time 2. To evaluate differences in demographics among each of the three racial-ethnic groups, within each time point, chi-square tests for independence (χ^2) and one-way analysis of variance tests (ANOVAs) were conducted across the three racial-ethnic groups. To analyze the relationship between clients’ race-ethnicity and treatment-related variables (e.g., referral source at admission) at each time period, logistic and linear regressions analyses were conducted separately for each time period, controlling for demographics and symptom severity, as these variables have been found to influence both access to and quality of care of racial and ethnic minority groups.² The controlling variables were entered in the first step: binary variables—gender (0 = male vs. 1 = female), marital status (0 = never married/divorced/single vs. 1 = married/civil union), education level (0 = no high school degree vs. 1 = at least high school degree/GED), housing status (0 = homeless vs. 1 = housed), and employment status (0 = unemployed vs. 1 = employed full/part time)—and continuous variables of age and global assessment of functioning at admission (GAF). The race-ethnicity variables were entered in the second step. For each dependent variable, one regression model was conducted with White Americans as the reference group. A second regression model was also conducted for each dependent variable with Hispanic Americans as the reference group.

The dependent variables investigated were the following variables that were already collected in the state data system: referral source at admission, legal status at admission, discharge reason, primary axis I diagnosis at admission, primary axis I diagnosis at discharge, primary axis II diagnosis at admission, and primary axis II diagnosis at discharge. Diagnoses were defined by DSM-IV-TR and ICD-9. All of these variables were categorical variables and were recoded into binary variables (1 = yes, 0 = no) reflecting primary categorical values in the data system. Referral source at admission was recoded into the following binary variables: self-referral (yes/no), inpatient referral (yes/no), criminal justice system referral (yes/no), and referral from other sources (e.g., outpatient, family, school, employment) (yes/no). Legal status at admission was recoded into three binary variables (yes/no): voluntary services, criminal justice system, and emergency certification. Discharge reasons were recoded into the following: facility concurs (yes/no), facility does not concur or leaving against medical advice (yes/no), and other (yes/no). Primary axis I diagnoses were recoded into five binary variables (yes/no). These groups included schizophrenia-spectrum, other psychotic disorders, mood disorders, substance use disorders, and other disorders (e.g., anxiety, cognitive, eating disorders). Primary axis II diagnoses were recoded into binary variables (yes/no): cluster A disorders (i.e., schizoid, schizotypal, paranoid), cluster B disorders (i.e., borderline, narcissistic, histrionic, antisocial), and cluster C disorders (i.e., avoidant, dependent, obsessive-compulsive personality disorder), as well as personality disorder NOS, and mental retardation/borderline intellectual functioning. Lastly, primary axis II diagnosis deferred, diagnosis unclear, or no diagnosis were grouped into a single binary variables (yes/no). Length of stay, as measured by the total number of days spent in inpatient services, was the final dependent variable.

Results

Demographic differences across racial-ethnic groups

Comparing across White Americans, African-Americans, and Hispanic Americans, there were differences in gender in 2010–2011 but not in 2002–2005 (see Table 1 for frequencies and statistics). Specifically, in 2010–2011, White Americans were less likely to be male. When comparing age across race-ethnicity, White Americans were most likely to be oldest and Hispanic Americans most likely to be youngest in both time periods (see Table 1 for frequencies and statistics).

Marital status varied across race-ethnicity at time 1 but not at time 2. In 2002–2005, Hispanic Americans were more likely to be married (see Table 1 for frequencies and statistics). Education level varied across race-ethnicity in both time periods. Hispanic Americans were least likely to have at least a high school degree (see Table 1 for frequencies and statistics). There were no significant differences in housing status in either time period. Employment status varied across race-ethnicity at time 1 but not at time 2: African-Americans were less likely to be employed full or part time (see Table 1 for frequencies and statistics). There were no racial-ethnic differences in GAF (Global Assessment of Functioning) at either time period (see Table 1 for frequencies and statistics).

Self-referral, inpatient referral, primary axis I diagnosis of mood disorders at admission, primary axis I diagnosis of a substance use disorder at admission, and primary axis II diagnosis of mental retardation/borderline intellectual functioning had significant racial-ethnic differences at time 1 and time 2. Leaving against medical advice, primary axis I diagnosis of schizophrenia at admission, primary axis I diagnosis of other psychotic disorders at admission, primary axis I diagnosis of other disorders at admission, primary axis II diagnosis of cluster B at discharge had significant racial-ethnic differences at time 1 but not time 2. Criminal justice referral and referral from other sources had significant racial-ethnic differences at time 2 but not time 1.

Table 1
Demographic and treatment-related variables by race and ethnicity

Variables	African-Americans		Hispanic Americans		Non-Hispanic White Americans		F or χ^2	df	p
	N or mean \pm SD	%	N or mean \pm SD	%	N or mean \pm SD	%			
Total number	2002–2005 494		411		478				
	2010–2011 291		117		450				
Male	2002–2005 335	68	280	68	303	63	2.93	2	0.23
	2010–2011 224	77	97	83	305	49	14.37	2	<0.001
Mean age	2002–2005 35.85 \pm 11.48		33.79 \pm 12.01		38.58 \pm 12.70		17.68	2,1380	<0.001
	2010–2011 38.23 \pm 11.88		35.91 \pm 14.62		41.81 \pm 14.07		11.92	2,855	<0.001
Marital status—married	2002–2005 36	7	46	11	32	7	6.74	2	0.03
	2010–2011 26	10	10	10	30	8	1.05	2	0.59
Education level—at least a high school degree	2002–2005 271	64	146	41	311	78	110.15	2	<0.001
	2010–2011 179	70	45	48	328	88	71.28	2	<0.001
Housing Status—housed	2002–2005 371	80	338	84	395	86	5.30	2	0.07
	2010–2011 248	92	92	91	378	95	2.78	2	0.31
Employment status—employed (full or part time)	2002–2005 29	6	37	10	48	10	6.21	2	0.05
	2010–2011 24	9	5	5	31	8	1.79	2	0.41
GAF at admission	2002–2005 31.72 \pm 10.21		30.94 \pm 10.55		31.83 \pm 10.52		0.834	2,1202	0.44
	2010–2011 41.53 \pm 20.23		38.32 \pm 17.23		38.46 \pm 17.36		2.58	2,807	0.08
Self-referral	2002–2005 64	13	23	6	62	13	16.31	2	<0.001
	2010–2011 71	24	9	8	62	14	22.13	2	<0.001
Inpatient referral	2002–2005 63	13	38	9	87	18	15.55	2	<0.001
	2010–2011 26	9	16	14	95	21	20.06	2	<0.001
Criminal justice referral	2002–2005 74	15	58	14	57	12	2.02	2	0.36
	2010–2011 100	34	47	40	120	27	10.06	2	0.007
Other referral	2002–2005 59	12	32	8	42	9	5.04	2	0.08

Table 1 (continued)

	African-Americans		Hispanic Americans		Non-Hispanic White Americans					
	2010–2011	29	10	13	11	73	16	6.57	2	0.04
Number of inpatient days	2002–2005	59.1 ± 98.4		61.9 ± 111.3		74.8 ± 112.1		2.91	2,1380	0.06
	2010–2011	102 + 309.71		141 + 467.21		100 + 177.27		1.02	2,855	0.36
Leaving AMA	2002–2005	30	6	10	3	11	2	12.06	2	0.002
	2010–2011	6	2	1	1	10	2	0.9	2	0.64
Primary axis I at admission— schizophrenia	2002–2005	129	28	42	11	69	16	43.06	2	<0.001
	2010–2011	62	21	22	18	79	18	1.62	2	0.45
Primary axis I at admission— other psychotic disorders	2002–2005	135	27	114	28	97	20	9.29	4	0.05
	2010–2011	95	33	27	23	130	29	3.79	2	0.15
Primary axis I at admission— mood disorders	2002–2005	94	20	158	41	176	40	55.48	2	<0.001
	2010–2011	18	6	19	16	114	25	44.85	2	<0.001
Primary axis I at admission— substance use disorder	2002–2005	84	18	37	10	59	13	12.60	2	0.002
	2010–2011	79	27	23	19	57	13	24.66	2	<0.001
Primary axis I at admission— other disorders	2002–2005	21	5	31	8	38	9	6.89	2	0.03
	2010–2011	37	13	26	22	70	16	5.76	2	0.06
Admission primary axis II—personality disorder NOS	2002–2005	16	4	24	6	29	7	5.30	2	0.07
	2010–2011	6	2	8	7	28	6	7.67	2	0.02
Admission primary axis II— mental retardation/BIF	2002–2005	26	6	26	7	10	2	10.13	2	0.006
	2010–2011	22	8	11	9	10	2	16.06	2	<0.001
Discharge primary axis II—cluster B	2002–2005	49	12	28	8	68	18	14.38	2	<0.001
	2010–2011	30	10	21	18	55	12	4.51	2	0.11

Table 1 (continued)

	African-Americans		Hispanic Americans		Non-Hispanic White Americans					
Discharge primary axis II—no diagnosis	2002–2005	295	60	247	60	256	54	5.15	2	0.08
	2010–2011	60	21	18	15	80	15	1.78	2	0.41

BIF borderline intellectual functioning

Table 2

Referral source, length of stay, and leaving against medical advice after controlling for demographic variables and symptom severity

Predictors	Self-referral		Inpatient referral		Criminal justice	
	2002–2005	2010–2011	2002–2005	2010–2011	2002–2005	2010–2011
I. Demographic variables						
Sex	1.03	1.29	1.48	0.64	0.26	1.61*
Marital status	1.20	1.55	0.96	0.97	1.02	0.59
Education level	1.59	0.25**	1.26	0.82	0.36***	2.15***
Employment status	1.51	1.39	0.22*	1.12	0.00	6.93**
Housing status	1.25	1.11	0.81	1.82	2.23*	0.30**
Admission age	1.01	1.00	1.02*	1.00	1.04***	1.02*
Admission GAF	1.10***	1.09***	1.00	0.98***	1.03**	0.99
II. Race-ethnicity						
African-American vs. White American	1.29	2.25**	0.63*	0.39**	1.39	1.29
Hispanic American vs. White American	0.46*	0.66	0.62	0.64	1.17	1.49
African-American vs. Hispanic American	2.79**	3.43*	1.02	0.61	1.18	0.86
Predictors						
	Referral from other sources (e.g., family, outpatient, residential)		Number of inpatient days		Leaving against medical advice	
	2002–2005	2010–2011	2002–2005	2010–2011	2002–2005	2010–2011
I. Demographic variables						
Sex	1.07	0.86	-0.04	0.05	1.30	0.84
Marital status	0.96	0.89	-0.05	-0.02	0.46	2.8 × 10 ⁷
Education level	0.77	0.75	-0.11**	-0.07	1.09	0.24
Employment status	0.93	0.53	-0.11**	-0.03	1.02	2.9 × 10 ⁷
Housing status	1.14	3.21**	-0.01	0.01	0.44*	10.24**
Admission age	1.00	0.98*	0.14***	0.05	1.01	1.01
Admission GAF	1.02	1.01	-0.06	-0.12**	0.97	1.01
II. Race-ethnicity						

Table 2 (continued)

Predictors	Referral from other sources (e.g., family, outpatient, residential)	Number of inpatient days	Leaving against medical advice
African-American vs. White American	1.17	-0.11**	2.67*
Hispanic American vs. White American	0.60	-0.09*	0.67
African-American vs. Hispanic American	1.96*	-0.02	3.97*

All the values are expressed as odds ratios

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3

Axis I and II diagnosis after controlling for demographic variables and symptom severity

Predictors	Admission primary axis I—schizophrenia		Admission primary axis I—other psychotic disorders		Admission primary axis I—mood disorders		Admission primary axis I—substance use disorder		Admission primary axis I—other disorder (e.g., anxiety, cognitive, eating)	
	2002–2005	2010–2011	2002–2005	2010–2011	2002–2005	2010–2011	2002–2005	2010–2011	2002–2005	2010–2011
I. Demographic variables										
Sex	0.51**	1.82*	0.93	0.91	1.57**	0.42***	1.21	1.45	1.19	1.14
Marital status	0.35*	2.75	1.00	1.73	1.22	1.00	2.06*	0.68	0.86	0.50
Education level (-hs vs. hst+)	0.79	0.82	1.35	1.00	1.17	0.76	0.73	0.90	0.47**	2.04**
Employment status	0.44*	2.01	0.34***	2.21	1.82*	1.79	1.66	1.52	0.72	0.40**
Housing status	0.68	1.81	1.62*	0.48	1.02	1.80	1.02	0.62	1.35	0.65
Admission age	1.03***	1.02*	0.99	0.98**	0.10	1.00	0.98	1.02**	0.98	0.99
Admission GAF	0.99	0.97***	0.96***	0.96***	0.99	0.99	1.07***	1.04***	1.02	1.04***
II. Race-ethnicity										
African-American vs. White American	2.01**	1.42	1.30	1.27	0.47***	0.22***	1.90**	2.39***	0.36**	0.54*
Hispanic American vs. White American	0.77	1.05	1.47*	0.71	1.21	0.79	0.68	2.06*	0.58	1.27
African-American vs. Hispanic American	2.63***	1.36	0.88	1.80	0.39***	0.28**	2.78***	1.16	0.63	0.42*

Predictors	Admission primary axis II—personality disorder NOS		Admission primary axis II—mental retardation/borderline intellectual functioning		Discharge primary axis II—cluster B		Discharge primary axis II—no diagnosis	
	2002–2005	2010–2011	2002–2005	2010–2011	2002–2005	2010–2011	2002–2005	2010–2011
I. Demographic variables								
Sex	1.54	0.54	0.80	0.32**	1.46	0.71	1.07	1.33
Marital status	0.48	0.60	1.29	2.07	0.92	0.69	1.33	1.18
Education level (–hs vs. hs+)	0.74	0.74	0.26***	3.51**	0.73	1.59	1.53**	0.35**
Employment status	0.59	5.04 × 10 ⁷	0.00	3.21 × 10 ⁷	0.84	1.36	1.85*	0.42
Housing status	0.48*	1.95	1.87	0.00	0.81	2.02	1.32	1.53
Admission age	0.97*	1.01	0.95**	0.96*	0.97**	0.98*	1.02**	1.01
Admission GAF	0.99	.98	1.01	.97*	0.99	0.98*	1.02**	.95***
II. Race-ethnicity								
African-American vs. White American	0.46*	0.36	2.66*	3.23*	0.68	0.75	1.27	1.87*
Hispanic American vs. White American	0.87	1.64	2.20	3.93*	0.35***	1.41	1.49*	1.07
African-American vs. Hispanic American	0.53	0.22*	1.21	0.82	1.94*	0.53	0.85	1.75

All the values are expressed as odds ratios. All significant findings at admission were also significant at discharge except there were no significant racial-ethnic differences for “Other psychotic disorders” at discharge
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Logistic regression results

Tables 2 and 3 show the results of each of the logistic and linear regression analyses, which examine the relationship between the treatment-related variables (e.g., referral source at admission) and race-ethnicity at time 1 and time 2. In the tables, first the odds ratios obtained in the logistic regression equations are reported with the White American reference group. In the last row of each table, the odds ratios of the second regression equations comparing African-Americans with Hispanic Americans are reported. Only the treatment variables with a significant relationship to race-ethnicity at either time 1 or time 2 are displayed in the tables. Ratios less than 1 indicate lower odds for the first group, whereas ratios higher or equal to 1 indicate higher odds for the first group. For length of stay, standardized betas (β) are given.

Referral source

Logistic regression showed that Hispanic Americans were significantly less likely than White Americans and African-Americans to self-refer at time 1 (for statistics see Table 2—i.e., for Hispanic American vs. White American $\text{stdbeta} = 0.46$, $p < 0.05$, for African-American vs. Hispanic American $\text{stdbeta} = 2.79$, $p < 0.01$). At time 2, African-Americans were significantly more likely than White Americans and Hispanic Americans to self-refer (see Table 2—i.e., for African-American vs. White American $\text{stdbeta} = 2.25$ $p < 0.01$, for African-American vs. Hispanic American $\text{stdbeta} = 3.43$, $p < 0.05$). Comparing the odds ratios as measures of effect sizes that can be compared across the varying sample sizes, African-Americans had higher odds of self-referral at time 2 than time 1 as compared to both other groups (i.e., White Americans and Hispanic Americans). With regard to referral from another inpatient setting, at both time 1 and time 2, African-Americans were significantly less likely to be referred by other inpatient settings than White Americans (see Table 2). Comparing odds ratios, African-Americans were even less likely to be referred by other inpatient units at time 2 than time 1 (e.g., as compared to White Americans the odds ratio at time 2 was 0.39 and at time 1 was 0.63). Criminal justice referral did not vary significantly by race-ethnicity at either time period (see Table 2). The odds ratios decreased slightly at time 2 for African-Americans as compared to both Hispanic Americans and White Americans while the odds for Hispanic Americans increased at time 2 compared to White Americans and African-Americans. Comparing referral from other sources (e.g., family, outpatient, residential, school), at time 1, African-Americans were more likely than Hispanic Americans to be referred by other sources but no racial-ethnic difference was significant at time 2 (see Table 2). Comparing odds ratios shows that the likelihood of African-Americans being referred by other sources switched at time 2: at time 1 African-Americans had higher odds of referral by other sources than White Americans ($\text{stdb} = 1.17$) and Hispanic Americans ($\text{stdb} = 1.96$) whereas at time 2, African-Americans had lower odds than White Americans ($\text{stdb} = 0.66$) and similar odds as Hispanic Americans ($\text{stdb} = 1.05$).

Treatment stay

Differences in number of inpatient days were apparent in time 1, with African-Americans ($M = 59.1$ days, $SD = 98.4$) and Hispanic Americans ($M = 61.9$, $SD = 111.3$) having shorter length of stay than White Americans ($M = 74.8$, $SD = 112.1$) (see Table 2). Racial-ethnic averages were not significantly different at time 2. In time 1, African-Americans were significantly more likely to leave against medical advice than White Americans and Hispanic Americans. At time 2, the African-American rate of leaving against medical advice lowered so that the differences were no longer significant (see Table 2). At time 2, the odds ratios of leaving against medical advice were smaller for African-Americans at time 2 than time 1 as compared to White Americans and Hispanic

Americans. For Hispanics, the odds of leaving against medical advice as compared to White Americans increased at time 2, although the odds did not reach statistical significance.

Diagnosis—axis I

For primary axis I diagnosis of schizophrenia at admission, at time 1, African-Americans were significantly more likely to be diagnosed with schizophrenia than White Americans and Hispanic Americans (see Table 3). At time 2, the percentage of African-Americans diagnosed with schizophrenia lowered so that the likelihood difference was no longer significant between the groups (see Table 3). Comparing odds ratios, odds of African-Americans being diagnosed with schizophrenia were greater at time 1 for both group comparisons. Hispanic Americans had higher odds of being diagnosed with schizophrenia as compared to White Americans at time 2.

For the diagnostic group “primary Axis I diagnosis at admission of psychotic disorders other than schizophrenia,” at time 1, Hispanic Americans were more likely than White Americans to receive those diagnoses (see Table 3). At time 2, the differences among the groups were not significant and Hispanic Americans had a lower percentage than the other two groups (see Table 3). Comparing odds ratios across time, the odds ratio comparing African-Americans to White Americans and the odds ratio comparing Hispanic Americans to White Americans were smaller at time 2 than time 1. The odds ratio comparing African-Americans to Hispanic Americans was substantially larger at time 2, although it did not reach significance.

For mood disorders, at time 1, African-Americans were significantly less likely than Hispanic Americans and White Americans to be diagnosed with mood disorders. At time 2, these differences remained significant (see Table 3). Comparing odds ratios, African-Americans had even smaller odds of being diagnosed with mood disorders at time 2 than time 1 as compared to both White Americans and Hispanic Americans. Hispanics Americans had smaller odds of being diagnosed at time 2 than time 1 as compared to White Americans.

With regard to substance use, at time 1, African-Americans were more likely than White Americans and Hispanic Americans to have a primary axis I diagnosis at admission of a substance use disorder. At time 2, both African-American and Hispanic Americans were more likely than White Americans to have a primary axis I diagnosis of a substance use disorder (see Table 3). Examining odds ratios, African-Americans had higher odds of diagnosis than White Americans at time 2 as compared to time 1. African-Americans had lower odds of diagnosis than Hispanic Americans at time 2 than time 1. Hispanic Americans had higher odds of diagnosis than White Americans at time 2 than time 1.

With regard to a primary axis I admission diagnosis of any other axis I disorder (e.g., anxiety disorders, eating disorders, dissociative disorders), at time 1, African-Americans were less likely than White Americans to receive these diagnoses. At time 2, African-Americans were less likely than Hispanic Americans and White Americans to be diagnosed with other disorders (see Table 3). Comparing odds ratios, African-Americans had higher odds of diagnosis compared to White Americans at time 2 than time 1, as did Hispanic Americans as compared to White Americans. African-Americans had a lower odds of diagnosis as compared to Hispanic Americans at time 2 than time 1.

Diagnosis—axis II

For primary axis II diagnosis at admission, at time 1, African-Americans were less likely than White Americans to be diagnosed with personality disorder not otherwise specified (see Table 3). At time 2, African-Americans were less likely than Hispanic Americans to be diagnosed with personality disorder not otherwise specified (see Table 3). Comparing odds ratios, African-Americans had a lower odds of diagnosis at time 2 than time 1 as compared to both White

Americans and Hispanic Americans. Hispanic Americans had a higher odds of diagnosis than White Americans at time 2 than time 1.

With regard to diagnoses of mental retardation or borderline intellectual functioning, at time 1, African-Americans were more likely than White Americans to have those as a primary diagnosis. At time 2, African-Americans and Hispanic Americans were both more likely to be diagnosed than White Americans with mental retardation or borderline intellectual functioning (see Table 3). Comparing odds ratios, African-Americans and Hispanic Americans had higher odds of diagnosis compared to White Americans at time 2 than time 1. African-Americans had lower odds of diagnosis than Hispanic Americans at time 2 than time 1. With regard to a primary axis II diagnosis at discharge of a cluster B personality disorder (i.e., borderline, histrionic, narcissistic, antisocial), at time 1, Hispanic Americans were less likely than White Americans and African-Americans to be diagnosed with one of these disorders. At time 2, these differences were no longer significant (see Table 3). Comparing odds ratios, African-Americans and Hispanic Americans had higher odds of diagnosis than White Americans at time 2 than time 1. African-Americans had lower odds of diagnosis than Hispanic Americans at time 2 than time 1. Further, at time 1, Hispanic Americans were more likely than White Americans to have a primary axis II discharge diagnosis of no diagnosis, diagnosis deferred, or diagnosis unclear. At time 2, African-Americans were more likely than White Americans to have a primary axis II discharge diagnosis of no diagnosis, diagnosis deferred, or diagnosis unclear (see Table 3). Comparing odds ratios, African-Americans had higher rates of diagnosis than White Americans and Hispanic Americans at time 2 than time 1. Hispanic Americans had lower odds of diagnosis than White Americans at time 2 than time 1.

Discussion

The current study's analyses documented numerous changes in racial-ethnic differences across time periods. With regard to demographics, males were less likely to be White at time 2, Hispanic Americans were more likely to be married at time 1, and African-Americans were less likely to be employed at time 1. Yet overall, there were some consistencies across time: White Americans were more likely to be older, Hispanic Americans more likely to be younger, and Hispanic Americans were more likely to be less educated. It is suspected that these differences found across time represent non-important demographic variations in the CT DMHAS inpatient population or differences due to the differing sampling strategies at time 1 and time 2 rather than true demographic shifts in the CT DMHAS population over time.

With regard to referral source (see Table 2), differences generally stayed in the same direction from time 1 to time 2. However, African-Americans were more likely to self-refer and less likely to be referred from inpatient settings at both time periods. This finding suggests that, in the mental health and substance use treatment system examined, African-Americans have to present themselves in order to enter inpatient mental health care, and that the usual referral sources for inpatient care (e.g., emergency department, clinician referral, other inpatient units) are not bringing African-Americans to inpatient care in the system. This finding needs further investigation to help better understand pathways to care for African-Americans. No significant differences in racial-ethnic group were found for criminal justice referrals for either time period. This finding conflicts with findings that African-Americans are overrepresented among those who are civilly committed to inpatient facilities.¹²

Treatment-related factors

Racial-ethnic differences in the rates at which the various groups were discharged against medical advice were significant at time 1. At time 2, these racial-ethnic differences in rates were non-significant, although higher odds were still demonstrated for African-Americans and Hispanic

Americans as compared to White Americans. For length of stay, African-Americans and Hispanic Americans had shorter lengths of stay than White Americans at time 1, but there was almost no magnitude of difference at time 2. The racial-ethnic differences that were documented match research showing mental health treatment dropout rates are higher in non-white populations.²⁸⁻³¹ It is possible that the racial-ethnic differences in treatment stay decreased over time as a result of state cultural competence initiatives targeted at improving the experience of African-Americans and Hispanics in inpatient care. Another possibility is that insurance regulations made length of stay in inpatient care more similar for everyone, regardless of race-ethnicity.

Diagnosis

When analyzing primary axis I diagnoses (see Table 3), racial-ethnic group differences generally decreased at time 2 for schizophrenia and other psychotic disorders, with the exception that significant differences remained for African-Americans diagnosed with mood disorders. The current finding that African-Americans were not more likely to be diagnosed with psychotic disorders at time 2 is in conflict with recent research, although the odds ratios were in the same direction as that research.^{11, 12, 15, 32} On the contrary, differences increased at time 2 for the grouping of “other disorders” (e.g., anxiety disorders, eating disorders, dissociative disorders) with African-Americans being less likely to receive such diagnoses than both White Americans and Hispanic Americans at time 2. This lack of significance at time 2 for schizophrenia and psychotic disorders could be partly due to changes in diagnostic practices as a result of statewide cultural competence initiatives (e.g., dissemination of the CLAS standards, cultural competence trainings on-site, establishment of on-site cultural competence committees), dissemination of the time 1 findings showing racial-ethnic differences in diagnosis, and national cultural competence initiatives. However, the persistence of lower diagnostic odds of anxiety disorders in African-Americans compared to White Americans at both time periods suggests that African-Americans are still receiving less inpatient services for these kinds of diagnoses than White Americans. In addition, the increase in odds of having a primary axis I admission diagnosis of substance use disorders at time 2 for both African-Americans and Hispanic Americans as compared to White Americans suggests that initiatives focusing on co-occurring disorders have increased awareness of mental health disorders in people with substance abuse problems. Perhaps at time 1, people with a primary axis I diagnosis of substance use disorder would be sent to a substance abuse inpatient facility rather than a mental health inpatient facility.

For axis II diagnoses, African-Americans and Hispanic Americans were more likely than White Americans to receive diagnoses of mental retardation or borderline intellectual functioning at time 2, showing an increase from time 1 where only African-Americans were more likely to receive the diagnosis. There is a long history of research showing intelligence tests are biased against people of color^{33, 34}. It is also possible that people in this sample received those diagnoses without psychological testing as a result of communication difficulties between clinicians and clients resulting from other factors such as low education, language or dialect barriers, or homelessness. Regarding personality disorder NOS, African-Americans were less likely than White Americans to receive this diagnosis at both time periods. For cluster B diagnoses at discharge, African-Americans and Hispanic Americans were diagnosed less often than White Americans at time 1, but at time 2 the odds of diagnosis increased for both groups as compared to White Americans, although these differences were not significant. Regarding having no primary axis II diagnosis at discharge, Hispanic Americans were significantly more likely than White Americans to have no diagnosis at time 1, whereas at time 2, Africans were more likely than White Americans to have no diagnosis. These lower rates of personality disorder diagnoses in minority groups agree with previous research that has found that African-Americans are less likely to be diagnosed with personality disorders than other race and ethnic groups.²¹

Across all analyses conducted, the current study's results suggest that racial-ethnic differences in inpatient mental health services generally improved at time 2. In total, while a small amount worsened, multiple improvements were found in racial-ethnic disparities at time 2. Specifically for African-Americans, disparities in being more likely to self-refer than other groups and less likely to be referred by other inpatient care actually worsened. Yet, at time 2, disparities where African-Americans were more likely to be referred by other sources, have a shorter length of stay, and be more likely leave against medical advice all decreased. Regarding African-Americans and diagnosis, the disparity in being more likely to be diagnosed with schizophrenia resolved at time 2. Disparities did increase at time 2 for African-Americans being diagnosed with the grouping of other axis I personality disorders. As for Hispanic Americans, improvements are found where this group no longer has significantly shorter lengths of stay, are no longer more likely to be diagnosed with the group of other psychotic disorders, and no longer more likely to be diagnosed with axis II diagnosis deferred or no diagnosis. Yet there was an increase in disparities where Hispanic Americans were more likely to be diagnosed with mental retardation or borderline intellectual functioning at time 2. Why did these changes occur? These results may be explained by the multiple initiatives in the interim that addressed cultural competence and differences at both national and local levels. The USA as a whole has been increasing efforts to improve the multicultural competency of behavioral health care. Examples of this at the national level can be found in policies such as the President's New Freedom Commission and the CLAS standards, which were written around the time of the time 1 data, but were implemented in the interim period between time 1 and time 2. In addition, SAMHSA has had system transformation and training initiatives that have focused on increasing cultural competence and reducing health disparities in the interim time period. The Affordable Care Act was also being developed in the interim time period, although it was not signed into law until 2010 when the time 2 data were being collected. Moreover, at the organizational level, hospitals, community mental health centers, and behavioral health clinics have adopted policies to be mindful of and address multicultural competency in the services they provide, in response to these national policies. Schools and training programs have also adopted similar policies, making diversity and multicultural competency training part of the required curriculum for obtaining degrees in the behavioral health field. Additionally, state licensing boards in some states have begun to require coursework in multicultural competency as well.³⁵

Lastly, at the state level, since 1999 CT DMHAS has an office directly charged to implement culturally competent care. Since 2004, this office has been directing a Health Disparities Initiative that has conducted quantitative^{10, 27} and qualitative³⁶ evaluations of health differences and cultural competence throughout the CT DMHAS system. Several workforce development initiatives have focused on increasing the cultural competence of current providers in the field and as well as the training of future providers. As part of this office, a statewide Multicultural Advisory Council has been implemented, bringing together providers and community members from throughout the state to implement cultural competence. Also, each state agency has a cultural competence plan and implementing this plan is monitored as part of the facility's periodic evaluations. Each state agency also has a cultural competence and diversity committee that is charged with evaluating the cultural competence of their agency and planning programming related to increasing cultural competence of the staff. In addition, a bi-level (i.e., targeting organizational-level cultural competence as well as staff training) cultural competence intervention was co-developed and piloted at one location by university faculty and persons in recovery.³⁷

In addition, multiple other state initiatives related to cultural competence were implemented between the two time periods. A grant from the Center for Medicaid Services trained providers in person-centered care planning at the CT DMHAS state-operated facilities which had a module on addressing culture and cultural competence. At the inpatient facilities, trainings were held on anti-bullying, cultural competence, decreasing seclusion and restraints, and de-

escalation. For instance, the number of restraint hours decreased by 30% from 2011 to 2012.³⁸ Third, the state Learning Management System offered continual trainings in cultural competence each year.

Strengths and limitations

This study adds to the small amount of literature on inpatient mental health care and the interaction of racial-ethnic groups on diagnosis and treatment-related factors. Strengths of this study include comparing racial-ethnic differences over time, relatively large sample sizes at each time period, and examining differences between African-Americans and Hispanic Americans in addition to comparing each of these groups in comparison to White Americans. There are also a number of limitations to this study. First, all of the data were obtained from the same behavioral health system in the CT DMHAS, thus limiting the ability to generalize these findings to other behavioral health systems across the country. Second, as this study did not have a longitudinal design, change over time cannot be assessed. The current study only compared whether differences are present for time 1 and later time 2, given that there are different clients at each time period. Additionally, due to there being a larger sample at the time 1 period, this difference may have caused a greater likelihood of significant differences at time 1 versus time 2. Also, the sampling strategies were different at each time period. At time 1 1500 clients from each racial-ethnic group were randomly selected, whereas at time 2 the entire population was analyzed. From this point forward, we will continue analyses of the entire population and expect that the sampling strategy would not have a significant impact on the findings. Nonetheless, it is possible that the differences in significance across the two time periods could be partly due to the differences in sampling strategies and sample sizes, although the effect sizes (as demonstrated by the odds ratios) were generally smaller at time 2 than time 1. Differences between time 1 and time 2 could also be due to changes in ethnic differences in entry into the system rather than changes in behavior within the system once admitted.

Another limitation is this study did not directly examine the effect of CT DMHAS's efforts to increase the multicultural competency of its staff. Including such data in the analysis would have enriched this study, allowing for the examination of whether these trainings affected treatment differences in racial-ethnic groups. Moreover, within-group differences for the three racial-ethnic groups used in this analysis are not examined. For example, within the African-American group, smaller sub-populations such as Afro-Caribbean Americans or those recently immigrated to the USA may exist which may have different referral pathways and treatment outcomes. Another limitation is that other racial-ethnic groups, such as Asian Americans, American Indians, and mixed race individuals were not included in this study due to very small sample sizes. These groups are unfortunately often not included in differences research due to the same reason.⁸ Moreover, Hispanic Blacks were excluded from this analysis so as to match the racial-ethnic groups used in the time 1 sample.

Implications for behavioral health

This examination of racial-ethnic differences and the differences across time periods is important to understand the current mental healthcare climate of racial-ethnic minorities in the USA as well as to furthering the pressing agenda to improve mental health care as described in the President's New Freedom Commission, the Department of Health and Human Services, and the Institute of Medicine²⁻⁴. The results of this study are also very applicable to the federal charge that improvements in racial and ethnic differences are especially needed at the public sector and in the state level.³

Although some improvements have been found, further change is still needed. Mental health practitioners would benefit from ongoing and increased multicultural competency training.^{3, 8, 25} Cultural competence training needs to be addressed throughout the many layers of the mental health system. This entails changes among administrators, policies, funders, health insurance providers, and more⁴. Increased programs that promote African-American, Hispanic, and other racial and ethnic groups' awareness of insurance and treatment options would be beneficial. Also, programs addressing stigma as a barrier to accessing and receiving mental health care for racial/ethnic minorities would also be beneficial, as stigma is still a large culprit in deterring many from receiving mental health care³. Finally, increased workforce development of minority group clinicians especially in areas serving higher concentrations of minority groups clients may be useful in further lessening racial-ethnic differences. Future differences research should examine the degree to which differences in care stems from the provider level versus the systems level or the policies level. These findings may be helpful in determining the appropriate action needed to solve this issue. Additionally, future differences studies would benefit from examining to what extent differences in behavioral health treatment are associated with clinician's level of cultural competency training.

Compliance with Ethical Standards

This study was approved by the Yale University Human Investigation Committee and the CT DMHAS Institutional Review Board.

Conflict of Interest The authors declare that they have no conflicts of interest.

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