Association of Black Race With Physical and Chemical Restraint Use Among Patients Undergoing Emergency Psychiatric Evaluation

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Objective: Few studies have examined the disproportionate use of restraints for Black adults receiving emergency psychiatric care. This study sought to determine whether the odds of physical and chemical restraint use were higher for Black patients undergoing emergency psychiatric care compared with their White counterparts.

Methods: This single-center retrospective cohort study examined 12,977 unique encounters of adults receiving an emergency psychiatric evaluation between January 1, 2014, and September 18, 2020, at a large academic medical center in Durham, North Carolina. Self-reported race categories were extracted from the electronic medical record. Primary outcomes were the presence of a behavioral physical restraint order or chemical restraint administration during the emergency department encounter. Covariates included age, sex, ethnicity, height, time of arrival, positive urine drug screen results, peak blood alcohol concentration, and diagnosis of a bipolar or psychotic disorder.

Results: A total of 961 (7.4%) encounters involved physical restraint, and 2,047 (15.8%) involved chemical restraint. Models with and without a race covariate were compared by using quasi-likelihood information criterion scores; in each instance, the model with race performed better than the model without. Black patients were more likely to be physically (adjusted odds ratio [AOR]=1.35; 95% confidence interval [CI]=1.07–1.72) and chemically (AOR=1.33; 95% CI=1.15–1.55) restrained than White patients.

Conclusions: After analyses were adjusted for measured confounders, Black patients undergoing psychiatric evaluation were at higher odds of experiencing physical or chemical restraint compared with White patients, which is consistent with the growing body of evidence revealing racial disparities in psychiatric care.

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Racial disparities in psychiatric care for Black individuals are widely documented in the United States (1) and include reduced access to psychotropic medication, fewer outpatient mental health appointments (2), and less psychiatric specialty care than for White individuals (3). Decades of evidence point to systemic or structural inequity, along with health care provider bias, contributing to observed disparities in psychiatric care (4, 5) and highlighting the vulnerability of intersecting identities, such as Blackness and mental illness, in the United States (6). Whether because of socioeconomic status or other factors, emergency departments (EDs) are a major point of access to psychiatric care. Compared with Whites presenting to the ED, Black patients endure longer wait times, receive lower emergency severity index scores, are less likely to be admitted, are less likely to receive blood tests or other procedures, and are more likely to experience in-hospital death after their ED visit (7). Similarly, compared with White patients in this setting, Black

patients receive less analgesic medication for abdominal pain, are less likely to be admitted to the hospital (8), and are less likely to undergo an electrocardiogram or chest

HIGHLIGHTS

- This study used electronic medical record data from 12,977 emergency department encounters to determine whether Black patients were more likely than their White counterparts to undergo physical and chemical restraint.

- Race was a significant predictor of physical and chemical restraint use for patients undergoing emergency psychiatric evaluation.

- Black patients receiving emergency psychiatric evaluation were more likely to undergo chemical and physical restraint compared with White patients.

radiograph (9). Although mental health–related visits account for an increasing proportion of ED visits (10), a setting in which Black individuals are consistently overrepresented (11), few studies are dedicated to elucidating disparities in emergency psychiatric care.

The use of physical or chemical restraint is common in emergency settings (12, 13). In one analysis of over 43,000 patients presenting to the ED, 84% of patients showing agitation received physical restraint, and 76% received sedation (12). Because restraint use is associated with adverse outcomes, such as aspiration, rhabdomyolysis, thrombosis, and posttraumatic stress symptoms (14–16), studies are needed to examine differential use of restraints in medically and psychiatrically vulnerable populations, such as among Black individuals. A pair of recent retrospective studies at large EDs found an association between Black race and physical restraint use (17, 18). A separate study using a national sample of ED visits revealed disproportionate chemical restraint use for Black patients, but the analysis was restricted to pediatric patients (19). Moreover, analyses on physical restraint in emergency settings have broadly examined the general ED population instead of focusing on individuals receiving psychiatric consultation (17, 18), a population at high risk of restraint (20). Given that patients with mental illness endure structural racism and bias (21, 22), disparities in restraint use in emergency psychiatric settings must be elucidated to develop clinically and culturally appropriate solutions.

In this study, we aimed to address this gap in the psychiatric literature by assessing whether Black patients receiving emergency psychiatric evaluation at a large academic medical center experienced different odds of receiving physical and chemical restraint compared with their White counterparts.

METHODS

Design, Setting, and Population
In this single-center study, we identified a cohort of adults (≥18 years) receiving psychiatry consultation in the Duke University Hospital ED from January 1, 2014, to September 18, 2020. The study protocol was reviewed by the institutional review board at Duke University Hospital and was determined to be exempt; informed consent was waived because the study posed minimal risk to individuals. We followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines.

Data Collection, Measures, and Outcomes
Participants were identified, and key variables were collected by querying the electronic health record through the Duke Enterprise Data Unified Content Explorer (23). The exposure was self-reported race, which was categorized as Asian, Black, White, multiracial, other, and unreported. "Multiracial" was used when patients self-selected two or more races; "other" was used when patients self-selected

American Indian-Alaska Native, Native Hawaiian-Pacific Islander, or a racial category not mentioned earlier; and "unreported" was used when patients did not report or declined to report race. Primary outcomes were record of violent (behavioral) physical restraint order, record of chemical restraint administration in the electronic medical record during the ED encounter, or both. Orders placed for violent restraints comprising physical holds, mitts, soft restraints, locking cuffs, or neoprene cuffs (invoked for patient behaviors including violence, severely aggressive behavior, self-injurious behavior, or inability to exhibit safe behaviors) were included. Orders for nonviolent (medical-surgical) restraints comprising siderails, mitts, soft restraints, vests or jackets, wheelchair belt loops, roll belts, and enclosed beds (ordered for patient behaviors including pulling of lines or tubes or behaviors related to toxic, metabolic, infectious syndromes, dementia, or brain injury) were excluded. The provider's selection of physical restraint type (violent or nonviolent) and reason were required in the order. Chemical restraint was defined as documentation in the medication administration record of a non–long-acting parenteral formulation of a first- or second-generation antipsychotic available on the hospital formulary (chlorpromazine, fluphenazine, haloperidol, olanzapine, and ziprasidone). In our institution, physical restraint for violent behavior generally took place in conjunction with chemical restraint in the context of a "behavioral emergency team activation," including nursing staff, psychiatry provider staff, and security.

Additional covariates extracted from the electronic medical record included age in years (18–19, 20–39, 40–59, 60–79, and 80–100), sex (male or female), self-reported ethnicity (Hispanic or non-Hispanic), height (in inches), time of arrival (12:00 a.m.–3:59 a.m., 4:00 a.m.–7:59 a.m., 8:00 a.m.–11:59 a.m., 12:00 p.m.–3:59 p.m., 4:00 p.m.–7:59 p.m., and 8:00 p.m.–11:59 p.m.), urine drug screen results (THC, cocaine, opiates, and amphetamine), and elevated peak blood alcohol concentration during the encounter (≥80 mg/dl). Bipolar or psychotic disorder diagnosis was identified through provider diagnosis codes linked to the encounter. Bipolar disorders were identified by using codes 296.0, 296.1, 296.4–296.8 from *ICD-9* and F30–F31 from *ICD-10*. Psychotic disorders were identified by using codes 295, 297–298 from *ICD-9* and F20, F22–F25, and F28–F29 from *ICD-10* on the basis of expert review and previous literature (24, 25).

Statistical Analysis
We constructed two separate logistic regression models to evaluate the association between race and the primary outcomes: use of physical restraint and use of chemical restraint. In both models, we accounted for correlation in the response due to repeated ED visits by using a generalized estimating equation with an exchangeable working correlation matrix. We adjusted for potential confounders—age, sex, ethnicity, height, arrival time, urine drug screen results, peak alcohol concentration, and diagnosis—selected on the basis of previous literature and expert opinion. We assessed

continuous variables for nonlinear functional relationships with the outcome and discretized age into 20-year categories and blood alcohol content as elevated (≥80 mg/dL) or not on the basis of the legal cutoff for intoxication. We evaluated models for multicollinearity by variance inflation factors, with all acceptable at <2. We performed the primary analysis with complete cases only. The primary covariate of interest, race, was self-reported within the electronic health record and, in some instances, could appear as "unreported" if the patient had elected not to answer. In those instances, we treated "unreported" as its own category. Odds ratios (ORs) for the race variable were calculated through exponentiation of logistic model coefficients and were reported with their 95% robust confidence intervals (CIs).

In addressing the potential effects of missing data among other variables, we imputed missing data by using the Multivariate Imputation by Chained Equations (MICE) package, version 3.13.0, in R. We used predictive mean matching to calculate a set of donor values for each missing value. Predictions were made on the basis of all other available nonmissing values for each observation, and five imputations were performed for each missing value. Linear regression was used to predict continuous variables, and logistic regression was used to predict categorical variables. For modeling purposes, pooled estimates were reported from the five imputed data sets.

We assessed whether race was a predictor of restraint by using the quasi-likelihood information criterion (QIC) goodness-of-fit statistic, and we assumed that smaller QIC values indicated better model fit. All data management and statistical analyses were conducted using R, version 3.6.0.

RESULTS

Sample

From January 1, 2014, to September 18, 2020, 12,977 unique emergency psychiatric encounters were identified. The median age of the cohort was 37.0 years (interquartile range [IQR] 27.0–52.0), and a majority of encounters involved male patients (N=7,159, 55.2%). A total of 6,287 (48.4%) encounters involved Black patients, 5,263 (40.6%) involved White patients, 4,383 (33.8%) encounters resulted in a psychotic disorder diagnosis, and 2,045 (15.8%) resulted in a bipolar disorder diagnosis (Table 1). A psychotic disorder diagnosis was recorded in 43.2% (N=2,719) of cases involving Black patients and 22.3% (N=1,174) of cases involving White patients. (A table showing patient characteristics stratified by race is available in an online supplement.) Complete demographic and clinical characteristics of the sample are presented in Table 1.

Outcomes

Over the study period, 961 (7.4%) encounters involved physical restraint, and 2,047 (15.8%) involved chemical restraint. A total of 797 (83%) encounters involving physical restraint also involved chemical restraint. Of the individuals undergoing physical restraint, 574 (60%) were male, 548 (57%) were Black, 284 (30%) were White, and the median age was 32.0 years (IQR 26.0–44.0). Of those who were chemically restrained, 1,243 (61%) were male, 1,136 (56%) were Black, 647 (32%) were White, and the median age was 35 years (IQR 27.0–49.0). Data were missing for sex (N=2, <0.01%), race (N=7, <0.01%), ethnicity (N=8, <0.01%), height (N=2,019, 15.6%, complete urine drug screen results (N=4,626, 35.6%), blood alcohol results (N=4,839, 37.3%), and psychiatric diagnosis (N=225, 1.7%).

Black patients underwent physical restraint during 8.7% of encounters and chemical restraint during 18.1% of encounters, whereas White patients underwent physical restraint during 5.4% of encounters and chemical restraint during 12.3% of encounters (Table 2). Compared with White patients, Black patients (OR=1.67; 95% CI= CI=1.44–1.94), multiracial patients (OR=2.09, 95% CI=1.60–2.75), and patients with unreported race (OR=2.09, 95% CI=1.28–3.42) had higher odds of undergoing physical restraint. (Table 3). Compared with White patients, Black patients (OR=1.57, 95% CI=1.42–1.75), multiracial patients (OR=1.84, 95% CI=1.50–2.26), and patients with unreported race (OR=2.27, 95% CI=1.60–3.23) had higher odds of undergoing chemical restraint (Table 4).

After adjusting for potential confounders of age, sex, ethnicity, height, arrival time, urine drug screen results, peak alcohol concentration, and diagnosis, the association between Black race and restraint remained. Black individuals were more likely to be physically restrained than White individuals (adjusted odds ratio [AOR]=1.35, 95% CI=1.07–1.72) (Table 3) and more likely to be chemically restrained than White individuals (AOR=1.33, 95% CI=1.15–1.55) (Table 4). We compared models with and without a race covariate, with QIC scores for both physical restraint (QIC including race=3,097.12; QIC excluding race=3,101.43) and chemical restraint (QIC including race= 6,012.51; QIC excluding race=6,032.44), and both models including race had lower QIC scores.

We used multiple imputation to assess for the potential effect of missingness on our conclusions (see online supplement). In each instance, Black race remained significantly associated with risk of physical restraint (AOR=1.28; 95% CI=1.09–1.52) and chemical restraint (AOR=1.26, 95% CI=1.12–1.41).

DISCUSSION

Using electronic health records for ED psychiatry patient encounters, we examined the association of Black race with use of physical and chemical restraints over a 6-year period. We found that race was a predictor of restraint use, and, after we adjusted for age, sex, ethnicity, height, arrival time, positive urine drug screen results, peak blood alcohol concentration, and diagnosis of a bipolar or psychotic disorder, Black patients were more likely to experience physical or chemical restraint than White patients.

TABLE 1. Demographic and clinical characteristics of patients receiving an emergency psychiatric consultation from January 1, 2014, to September 18, 2020

| | Overall (N=12,977) | | Physical restraint | | | | Chemical restraint | | | |
| | | | No (N=12,016) | | Yes (N=961) | | No (N=10,930) | | Yes (N=2,047) | |
Characteristic	Median	IQR	Median	IQR	Median	IQR	Median	IQR	Median	IQR
Age (years)	37.0	27.0–52.0	38.0	27.0–52.0	32.0	26.0–44.0	38.0	27.0–52.0	35.0	27.0–49.0
Height (inches)[a]	67.0	64.0–70.0	67.0	64.0–70.0	67.0	64.5–70.5	67.0	64.0–70.0	67.0	64.0–71.0

	N	%[b]	N	%[b]	N	%[b]	N	%[b]	N	%[b]
Sex										
Female	5,816	44.8	5,430	45.2	386	40.2	5,013	45.9	803	39.2
Male	7,159	55.2	6,585	54.8	574	59.7	5,916	54.1	1,243	60.7
Missing	2	<.01	1	<.01	1	0.1	1	<.01	1	<.01
Race										
Asian	234	1.8	221	1.8	13	1.4	202	1.8	32	1.6
Black	6,287	48.4	5,739	47.8	548	57.0	5,151	47.1	1,136	55.5
White	5,263	40.6	4,979	41.4	284	29.6	4,616	42.3	647	31.6
Multiracial	682	5.3	609	5.1	73	7.6	542	5.0	140	6.8
Other	326	2.5	302	2.5	24	2.5	278	2.5	48	2.3
Unreported	178	1.4	159	1.3	19	2.0	135	1.2	43	2.1
Missing	7	0.1	7	0.1	0	—	6	0.1	1	0.0
Ethnicity										
Hispanic	566	4.4	531	4.4	35	3.6	499	4.6	67	3.3
Non-Hispanic	12,137	93.5	11,234	93.5	903	94.0	10,207	93.4	1,930	94.3
Unreported	266	2.0	243	2.0	23	2.4	217	2.0	49	2.4
Missing	8	<0.1	8	<0.1	0	—	7	<0.1	1	<0.1
Shift										
12:00 a.m.–3:59 a.m.	1,620	12.5	1,503	12.5	117	12.2	1,357	12.4	263	12.8
4:00 a.m.–7:59 a.m.	782	6.0	708	5.9	74	7.7	643	5.9	139	6.8
8:00 a.m.–11:59 a.m.	1,640	12.6	1,491	12.4	149	15.5	1,367	12.5	273	13.3
12:00 p.m.–3:59 p.m.	2,881	22.2	2,638	22.0	243	25.3	2,371	21.7	510	24.9
4:00 p.m.–7:59 p.m.	3,143	24.2	2,933	24.4	210	21.9	2,689	24.6	454	22.2
8:00 p.m.–11:59 p.m.	2,911	22.4	2,743	22.8	168	17.5	2,503	22.9	408	19.9
Diagnosis										
Bipolar disorder	2,045	15.8	1,801	15.0	244	25.4	1,562	14.3	483	23.6
Psychotic disorder	4,383	33.8	3,877	32.3	506	52.7	3,275	30.0	1,108	54.1
Missing	225	1.7	216	1.8	9	0.9	211	1.9	14	0.7
Laboratory tests[c]										
Amphetamine[d]	320	3.8	303	3.9	17	3.0	273	3.9	47	3.3
THC[e]	2,239	26.8	1,996	25.7	243	42.6	1,725	24.9	514	35.9
Cocaine[f]	1,646	19.7	1,548	19.9	98	17.1	1,389	20.1	257	17.9
Opiate[g]	552	6.6	519	6.7	33	5.8	463	6.7	89	6.2
Peak ethanol level ≥80 mg/dl[h]	1,063	13.1	1,006	13.3	57	10.1	900	13.4	163	11.6

[a] Height was missing from 2,019 (15.6%) encounters.
[b] Denotes column percentages.
[c] Amphetamine screen was not obtained in 4,619 (35.6%) encounters; THC screen was not obtained in 4,626 (35.6%) encounters; cocaine screen was not obtained in 4,616 (35.6%) encounters; opiate screen was not obtained in 4,618 (35.6%) encounters; blood alcohol level was not obtained in 4,839 (37.3%) encounters.
[d] Total N=8,358; physical restraint: no, N=7,787; yes, N=571; chemical restraint: no, N=6,925; yes, N=1,433.
[e] Total N=8,351; physical restraint: no, N=7,780; yes, N=571; chemical restraint: no, N=6,919; yes, N=1,432.
[f] Total N=8,361; physical restraint: no, N=7,788; yes, N=573; chemical restraint: no, N=6,926; yes, N=1,435.
[g] Total N=8,359; physical restraint: no, N=7,788; yes, N=571; chemical restraint: no, N=6,926; yes, N=1,433.
[h] Total N=8,138; physical restraint: no, N=7,575; yes, N=563; chemical restraint: no, N=6,730; yes, N=1,408.

Our findings are consistent with two other recent observational studies demonstrating increased risk of physical restraint with Black patients compared with their White counterparts in the emergency setting (17, 18). However, our sample had a greater proportion of Black patients than these studies (48.4% versus 10%−28.2%), and the rate of physical restraint (7.4%) was relatively high in comparison (1%–1.4%). The high rate of physical restraint in the emergency psychiatric setting is consistent with findings that patients with mental disorders are at increased risk for undergoing physical restraint (17, 18). Our findings align with a smaller observational study evaluating antipsychotic use in a psychiatric emergency setting, where physical restraint occurred in 9% of encounters (26).

Our findings that Black patients are at increased risk for chemical restraint compared with White patients are

TABLE 2. Unadjusted rate of physical restraint and chemical restraint use, by patient's race

Characteristic	Overall (N=12,977)		Black (N=6,287)		White (N=5.263)	
	N	%	N	%	N	%
Patients receiving physical restraint	961	7.4	548	8.7	284	5.4
Patients receiving chemical restraint	2,047	15.8	1,136	18.1	647	12.3

consistent with the findings of Segal et al. (26). This observational study, conducted 25 years ago, included 442 independent observed evaluations in the psychiatry emergency setting. Clinicians, most of whom were White, prescribed more oral and parenteral antipsychotic medications to Black patients compared with White patients, even after the study controlled for psychotic disorder, disease severity, and physical restraint (26). Recent studies have documented disparities in the prescription of antipsychotics for Black individuals compared with that for White individuals, including greater duration and higher dosing of antipsychotics and increased likelihood of receiving first-generation medication (27–29). To our knowledge and disappointment, our study is the first in 25 years to demonstrate that such disparities have persisted in the adult emergency psychiatric setting. Our findings are also consistent with recent results among a national sample of pediatric patients demonstrating a higher rate of chemical restraint use during mental health visits for Black patients compared with White patients (19).

In adjusting for height in the analysis, we sought to adjust for physical size as a contributor to perception of risk of violence, and we still found significantly higher rates of physical and chemical restraint for Black patients compared with White patients. More restraint use for Black individuals could reflect contributions from processes of both interpersonal and systemic racism that were not measured in this study. Indeed, a previous meta-analysis has indicated that U.S. physicians have implicit preference for White individuals, although how this preference has directly affected clinical decision making, on a large scale, remains less clear (30). All but one of the studies in the analysis used vignettes instead of live patient encounters, and none of the studies examined the impact of bias on actual physician decision making in the ED (30). Black individuals also are recognized as having less access to outpatient psychiatric appointments, psychotropics (2), and specialty care (3) and, therefore, might present to care with more severe symptoms. Paradoxically, qualitative research describes restraint use itself as a barrier to ED care because patients report experiences of restraint as dehumanizing, leading to poor sense of well-being, distrust, and avoidance of health care (16). Finding ways to humanize patients' experiences with emergency psychiatric services, especially through decreasing unnecessary restraint use, may improve earlier help-seeking efforts for at-risk patients. There is growing recognition that Black individuals are more likely to access mental health services through law enforcement (31), which might influence clinician perception of dangerousness and heighten patient stress. Further studies should assess patients' access to mental health services and interactions with restraint use.

There were several limitations of our study. The first category of limitations concerned restraint use. We defined chemical restraint as administration of first- or second-generation (non–long-acting) parenteral antipsychotics available on our formulary. We did not measure nonantipsychotic chemical restraint (e.g., benzodiazepine or barbiturates) use, given their common use for alcohol withdrawal, and we did not measure use of oral antipsychotic or sedative medications, some of which may be used for restraint. Our definition was also based on the assumption that parenteral antipsychotics were used for restraint in a population receiving psychiatric consultation in the ED. Therefore, we may have underrecognized chemical restraint use overall. Our model may also have underrecognized physical restraint, as we counted physical restraint only when an order was present. We could have missed actual restraint use in certain cases, and reason for restraint could have been misclassified. We also were not able to determine the appropriateness of use of physical or chemical restraint, as our electronic medical record did not include an objective measure of appropriateness of physical or chemical restraint use or objective measure of patient agitation or clinical condition.

The second category of limitations concerned confounders. Given the nature of the electronic medical record and the retrospective cohort study design, there may have been factors contributing to outcomes that we were not able to measure or include in our models. However, treating

TABLE 3. Adjusted odds of receiving physical restraint, by patient's race[a]

Characteristic	OR	95% CI	AOR	Robust 95% CI
Asian	1.03	0.58–1.83	0.58	0.21–1.64
Black	1.67	1.44–1.94	1.35	1.07–1.72
Multiracial	2.09	1.60–2.75	1.84	1.20–2.80
Other	1.39	0.90–2.15	1.32	0.65–2.65
Unreported	2.09	1.28–3.42	0.84	0.29–2.43

[a] Reference group: White.

TABLE 4. Crude and adjusted odds of receiving chemical restraint, by patient's race[a]

Characteristic	OR	95% CI	AOR	Robust 95% CI
Asian	1.13	0.77–1.66	1.10	0.66–1.84
Black	1.57	1.42–1.75	1.33	1.15–1.55
Multiracial	1.84	1.50–2.26	2.11	1.56–2.84
Other	1.23	0.90–1.69	1.52	0.94–2.46
Unreported	2.27	1.60–3.23	1.30	0.64–2.65

[a] Reference group: White.

psychotic disorder diagnosis as a confounder in the study provided a conservative estimate for the relationship between Black race and restraint, given that Black patients are more likely to be overdiagnosed with psychotic disorders compared with White patients (32). Although there was a significant degree of missing data, particularly within drug screen, height, and blood alcohol data, the primary association observed between race and restraints was stable across both complete-case and multiple imputed analyses.

The final set of limitations concerned causality and generalizability. The retrospective nature of the study limited the capacity to make direct causal claims. Although we were able to analyze data from a large number of encounters, our single-center design may limit generalizability to other regions or hospital settings. In light of increasing evidence regarding social determinants and health disparities, we believe that our findings are of broad relevance to other health care institutions and systems. Finally, analyses of race-based differences are challenging, considering that race is a social construct. Accordingly, observational databases, including electronic health records, are limited in their ability to document patient race accurately and are, at times, incomplete (33). The increased rate of restraint receipt in the "unreported" race category is consistent with previous literature (18) and likely results from patients who were unable to provide information because of acute distress or illness. Despite these limitations, utilizing self-reported race as documented in the electronic medical record, we found race-based disparities in emergency psychiatric treatment. Our large cohort of patients evaluated in the psychiatric emergency setting extends the literature on the role of Black race in restraint use and suggests important areas for further scholarly inquiry. Our findings suggest areas for improvement in the provision of equitable and accessible psychiatric care.

CONCLUSIONS

The finding that Black patients are more likely to undergo physical and chemical restraint in an emergency psychiatry setting adds to a growing body of literature regarding emergency care settings and restraint use and extends these findings to an intersectionally vulnerable group: patients of color receiving psychiatric consultation. Observed differences remain, even after adjusting for relevant confounders. The observational nature of the study limits our ability to make causal claims, but our findings nonetheless suggest ongoing disparities in psychiatric care for Black patients in the prehospital and emergency settings. These data support the need for further work elucidating where the disparities arise in order to improve equity in and access to care.

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