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“Analgesic Use in U.S. Emergency Departments for Patients Reporting Moderate to Severe Pain: Diagnosis and Select Patient Characteristics Influencing Narcotic Analgesic Prescribing Practices”

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ABSTRACT

Analgesic Use in U.S. Emergency Departments for Patients Reporting Moderate to Severe Pain:
Select Patient Characteristics Influencing Narcotic Analgesic Prescribing Practices

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Objective:

This study aims to examine the relationship between emergency department patient encounter characteristics and narcotic analgesic prescribing practices in order to determine what patient characteristics, if any, influence the decision to prescribe narcotics.

Methods:

Cross sectional data on patients presenting to U.S. emergency departments from the 2003 and 2004 National Hospital Ambulatory Medical Care Survey were analyzed. Patients reporting moderate to severe pain were included in the sample and analysis. Chi square tests of significance were used to assess the association between individual demographic and encounter characteristics to narcotic prescription or administration. Separate multiple logistic regressions were then performed on patients presenting with one of the three most common diagnosis categories or reasons for visit, since this was thought to also influence the decision to prescribe narcotics or not. Multivariate analysis produced adjusted odds ratios and 95% confidence intervals in order to determine the independent associations between each predictor variable and narcotic medication prescription or administration.

Results:

Our sample included 26, 248 individuals presenting to U.S. emergency departments with moderate to severe pain as recorded by the NHMCS survey. Various patient and encounter characteristics appeared to influence narcotic administration in the univariate analysis including age, race, ethnicity, alcohol use, method of payment, geographic location and whether or not visit was related to a work injury or illness. No gender differences were found. Combining the top 3 reasons for visit, we found that race, patient alcohol use, age, geographic location and ethnicity all had significant bearing on the prescription of narcotics. Much of this was true when looking at top three diagnoses. Age, race, patient alcohol use, and geographic location were all associated with significantly different rates of narcotic administration, while ethnicity dropped out of significance. Black race, in both subcategories of analysis, showed the greatest association with decreased odds of receiving narcotic drugs in the ED.

Conclusion:

While initiatives like Healthy People 2010 are aimed at improving health and eliminating health care disparities, it appears that disparities still do exist on many levels. As it has been concluded through various other studies, it appears that race does influence health care providers' decisions to prescribe or administer narcotics. In January of 2001 JAHCO revised their standards to better address pain management of patients in the United States. While pain may be better-evaluated and recorded and overall rates of pain medication administration or prescription may have improved, it appears that the common disparities have not.

Background

Pain is one of the most common complaints in U.S. emergency departments with up to 78% of patients reporting pain.¹ The lack of adequate pain control has been a significant concern in the medical community for many years and numerous medical groups and studies have been targeting improvements in pain control.² In fact JCAHO in 2001 revised its pain standards in hopes of improving both the evaluation and treatment of pain in healthcare facilities around the United States.³ Although it has been studied and hypothesized that overall frequency of analgesic medications have increased in the United States⁴ it is postulated that disparities in the prescription of analgesics still persist.⁵ Many studies have concluded that patient gender and race can oftentimes predict the amount of analgesic given to patients in a variety of clinical settings and in general, women- and minorities receive less analgesic than men and non-minority patients undergoing similar medical procedures.^{6,7,8,9}

In recent studies Todd et al^{10,11,12,13} demonstrated that African Americans and Latinos were significantly less likely to receive analgesia in the emergency department (ED) for isolated long bone fractures than were Whites, despite the fact that physicians rated the patients' pain as similar in severity. Though analgesics and pain control in general have been the main focus of analgesic studies in recent years, of increasing concern and focus is the prescription of opioid analgesics. It has been theorized that Opioids, like analgesics in general, have also been prescribed less to minorities than to their non-minority counterparts. In fact in one study, Blacks in particular were found in general to be less likely to receive opioids in the emergency department, or as discharge medications.¹⁴

The reasons for these types of disparities are far from clear and several hypotheses have been proposed.^{15,16} In terms of opiates, many researchers postulate that their prescription may raise physician concerns that the patient may be seeking opioids in order to satisfy an addiction or to sell them. Physicians may have more negative perceptions of minority patients^{17, 18} and feel they are at higher risk for abuse or sale of the opioid.¹⁹ In addition to this, various other studies implicate communication difficulties as the reason for the differences in prescription patterns.²⁰

Despite the differences in findings in previous studies this study hopes to examine the most recent emergency department data provided by the National Center for Health Statistics through the NHAMCS survey to determine whether disparities between opioid prescribing practices appear to exist, and to determine what patient or encounter characteristics may be associated with different patterns of prescription.

Methods

Study Population:

We combined data from the 2003 and 2004 National Hospital Ambulatory Medical Care Survey (NHAMCS), which was directed by the Center for Disease Control and Prevention's National Center for Health Statistic. This study used a 4-stage probability sampling procedure that selected counties, hospitals, and emergency service areas to obtain a nationally representative estimate of emergency department encounters. Then, NCHS trained hospital staff within those hospitals selected a random sample of patients from these emergency departments during a randomly assigned four week period. Under indirect supervision of the NCHS, hospital staff for

each selected encounter completed a patient record form. These were then validated by the NCHS. Quality control procedures to assure accurate recording of data as well as to minimize missing cases or data were undertaken throughout the process.

We included only ED visits for patients whose encounter log had pain recorded as moderate to severe. Patients whose pain was recorded as moderate to severe were included in the study because it was felt that those complaining of moderate to severe pain were more likely to receive narcotic analgesic medications thus increasing the power of our study. In addition we felt that including only moderate or severe pain would serve to eliminate or lessen differences in narcotic analgesic administration that may be due to associations between any uncharted patient characteristics and presenting level of pain. Those without pain level recorded were excluded from our analysis.

Patient demographic data as well as other patient encounter characteristics were examined for all patients presenting with moderate to severe pain. We first conducted a descriptive overview of the patient population, including demographic and clinical features. To further explore disparities in narcotic administration or prescription, we conducted two multivariate logistic regression analyses on, 1) patients who reported one of the three most common general classifications of “reason for visit” and 2) patients receiving one of the three most common diagnoses as outlined by the *International Classification of Diseases, 9th Revision*. ‘Reason for visit’ was separated into general categories as provided by NCHS coding with the three most common reasons for visit being, 1) musculoskeletal complaints, 2) injuries, or 3) digestive disorders.

Diagnosis may in fact be a more objective measure to base any hypothesis on prescription practices since both the diagnosis and the choice of prescription medication are an outcome resulting from the same interpreting individual. For this reason we also conducted a second multivariate logistic regression for patients with the three most common diagnosis categories: 1) injuries and poisonings, 2) symptoms, signs and ill-defined conditions and 3) musculoskeletal system injuries or illnesses.

Outcome Variable:

Each medication administered in the ED or prescribed at discharge was recorded in the patient encounter log by hospital staff. Up to eight drugs could be logged on the encounter form. Each drug was assigned a unique numerical value that was subsequently converted into a drug category code based on guidelines determined by NHAMCS. These drug codes were then abstracted from the patient record form and drugs were considered to be “Narcotic analgesic medications” if they corresponded to the National Drug Code Directory codes for “narcotic analgesia” which was number 1721. From this data, we were able to measure our primary outcome variable, which was the presence or absence of any narcotic analgesic administered or prescribed to the patient.

Independent Variables

Classification of individuals into racial and ethnic groups was conducted by hospital staff. Unless it was hospital procedure, recording staff members did not ask patients of their race or ethnicity. Race or ethnicity was therefore a subjective measure based on the provider or healthcare worker's personal interpretation of race and ethnicity. The NHAMCS classified the patient's race as White, Black, American Indian or Alaska Native, Asian or Pacific Islander, or other. Because of small numbers, we combined the latter races to form three categories, White, Black, and Other. The patient's ethnicity was categorized as Hispanic/Latino or non-Hispanic/non-Latino.

Many factors other than race/ethnicity were also considered as possible determinants effecting the prescription of narcotic analgesics. Included in our analysis were insurance coverage (recorded as method of payment), patients' age, sex, alcohol use, geographic location or residence and whether or not injury or illness was work related.

Method of expected payment was categorized as private, Medicare, Medicaid, worker's compensation, self-pay/uninsured and other. 1040 case or four percent were unknown or missing.

"Patient age" was recoded into six age ranges with roughly similar proportions.

Alcohol use was recorded as patients use, other person's use, both patient and other's use, no alcohol use. This variable was recoded into a binary variable based on whether or not any type of patient alcohol use was determined to contribute to the ED encounter. For instance both patient

and other persons use was included into positive alcohol use, while other person's use was included in no alcohol use. By doing so, we eliminated the effect that another person's alcohol use alone would have had on the statistical analysis.

Geographic location was categorized as Northeast, Southeast, Midwest, or West. Determination of categorized location was done by NCHS staff and was based on zip code recorded on the patient survey.

Reason for visit and diagnosis was included in the multivariate analysis because they were found to have a statistically significant effect on our outcome variable during the univariate analysis.

We limited our analysis to the top three reasons for visit and diagnosis as mentioned beforehand.

Analysis:

Descriptive statistics were used to summarize the data. Chi square tests of significance were used to assess the association between individual demographic and encounter characteristics to narcotic prescription or administration. Statistically significant associations were then later included in multiple logistic regression models that produced adjusted odds ratios and 95% confidence intervals. Multiple logistic regressions were performed on patients presenting with one of the three most common diagnosis categories or three most common reasons for visit since both diagnosis and reason for visit was found to have significant association with narcotic prescription or administration in the univariate analysis. SPSS 13.0 was used for all analysis.

Results

Sample Characteristics:

As seen in Table 1, of the 26248 patients with moderate to severe pain, 74.1% (n=19,442) were White, 22.7% (n=5951) were Black and 3.3% (n=855) were classified as other. Hispanics comprised 12.5 % (n=3272) of this patient population. There were more females (n=14,785) than males (n=11,463) in our sample accounting for over 56.3% of the encounters. Average age was 37.7 (median 36.0). Medications were administered or ordered in 85.9% (n=22,536) of the patient encounters with two medications (mean=2.26) average for each patient (not included in Table 1.) Narcotics, as determined by NCHS coding, were administered in 39.9 % or 10,463 encounters. Almost 4% (973 [3.7 %]) of the visits were recorded as work related. Patient's alcohol use was determined to be contributory in 1.7% (n=439) of the encounters. As for method of payment for services, private insurance had the highest frequency (n=10,153) followed by Medicaid and self-pay. Workers compensation accounted for 621, or 2.4 %, of payment methods. Most (38.7 %) of patients in the survey were from the South, followed by Northeast, Midwest, and West with 21.5, 20.5, and 19.3 percent respectively.

As mentioned earlier musculoskeletal (n=5657), injuries (n=4976), and digestive (n=4541) complaints were the top three reasons for patient visits. As for patient diagnosis, injuries and poisonings accounted for the most with 7,840 or 29.9 % of cases. Musculoskeletal (n=2,573,

9.8%) and ill defined symptoms and signs (n=5080, 19.4%) accounted for the remaining top three diagnoses.

Univariate Analysis:

In univariate analysis, individuals labeled as Black were least likely to receive narcotics as compared to Whites or Other (Whites 42.4%, Other 37.0%, Blacks 32.1%). Hispanic or Latinos were also found to be less likely to receive narcotic analgesic under the univariate analysis than were non-Latino (35.1 % vs. 40.5%, respectively.) In general, it appeared that narcotic administration increased with age from 0 to 44 and declined slightly after that. 35 to 44 years of age appeared to be the most likely to receive narcotics. Gender did not show a significant association with narcotic administration or prescription ($p = .30$). In addition to the above, it was found that patients' alcohol use had a significant association with narcotic administration ($p < .001$). Patients with a positive alcohol use received narcotics 29.4% of the time as compared to those reporting no alcohol use who received it 40.0% of time. Although not statistically significant under the univariate analysis, persons whose injuries or illnesses were reported as work related received narcotics about 5 % more often than those that were non work related. Geographic location was also found to be a statistically significant indicator of narcotic prescription ($p < 0.001$). Those persons living in the Northeast were prescribed narcotics 30.2% of the time compared to those in the west who received narcotics almost half the time (48.7%.) Expected source of payment was also found to have a significant association with the prescription or administration of narcotics. Those on Medicaid received narcotics significantly less (36.1 %) than those categorized as workers' compensation that received narcotics at the

highest percentage (45.6%, $p < .001$). Both reason for visit and diagnosis were significantly associated with the outcome variable ($p, .001$). We thus included all the above-mentioned variables, except for patient sex, in the multivariate analysis.

Multivariate Analysis:

As mentioned previously multivariate analysis, looking at the receipt of narcotics was performed including the same independent variables except for sex. Two multivariate models were run; one on individuals within the sample population representing with the top three reasons and the second on patients with the top three most common physician diagnoses.

Top Three Reasons for Visit (RFV) Combined

Table 2 reports the crude and adjusted odds ratios for receipt of narcotics amongst those individuals within the three most common “reason for visit” categories. In univariate analysis the odds of receiving narcotics were less for Blacks and individuals categorized as “Other.” Blacks were found to receive narcotics almost 34% less, and those classified as “Other” received narcotics almost 28 % less than White individuals (Blacks -OR 0.66, CI [.60 - .72], Other (OR 0.72, CI [.58-.90].) Any age range greater than 12 years of age was associated with increased percentage of narcotic administration or prescription.

In general adjusted odds ratios for age remained fairly similar to the crude odds ratios and all ages greater than twelve maintained a statistically significant greater rate of narcotic

administration than those aged twelve or less. Those aged 35 to 44 were almost 6 times as likely to receive narcotics as persons age 12 or less (adjusted OR = 5.85, CI [4.90 - 6.99]). In terms of method of payment, while Medicaid appeared to be the only method of payment associated with a significantly different percentage of narcotic prescription in the univariate analysis, no method of payment appeared to retain significance in the multivariate analysis. Positive alcohol use and Latino/ Hispanic ethnicity were found to retain significance in the multivariate analysis, with the odds of receiving narcotics less than their counterparts. Latinos or Hispanics received narcotics nearly 14% less than non-Latino counterparts (CI 0.76 - 0.97). Injury or illness due to work was not found to have a significant association with narcotic administration or prescription. Also, geographic location appeared to remain a significant determinant of narcotic administration. Those in the west were more than twice as likely to receive narcotics as those individuals in the northeast (OR = 2.26, CI [2.00 - 2.55]). Individuals with injuries or digestive reasons for visit were found to be less likely to receive narcotic analgesics compared to those with musculoskeletal complaints.

Top Three Diagnoses Combined: (Table 3)

When patients complaining of moderate or severe pain were analyzed by top three diagnosis categories many of the same trends appeared as compared to top three reasons for visit. As compared to those diagnosed with some type of injury, individuals with musculoskeletal diagnosis had a higher odds of receiving narcotics (adjusted OR = 1.35, CI [1.22 - 1.50]) while those with an ill-defined diagnosis received narcotics less (adjusted OR = 0.76, CI [0.70 - 0.82]).

As seen in Table 3, race, age, alcohol use, and geographic location were all found to be significantly associated with differences in narcotic prescription. Blacks received narcotics nearly 40 % less and persons coded as “Other” race, received them nearly 30 % less than their White counterparts, (adjusted odds ratio 0.61, CI [0.56 - 0.67] and 0.70, CI [0.56 - 0.87] respectively). In this model, ethnicity failed to show a significant association with narcotic administration or prescription. Alcohol again was associated with lower rate of narcotic administration. Age greater than 12 years was associated with increased odds of narcotics prescribed or administered, with an increasing trend in the OR seen until age 60. As in the top reasons for visit analysis, western geographic location was associated with highest rate of narcotic administration (OR 2.26, CI [2.01 - 2.55], with all regions showing increased odds as compared to the northeast.

Table 1. Demographic and clinical characteristics of patients with Moderate to Severe Pain (n = 26,248)

	Number of Patients	% of total
All Patients with Moderate to Severe Pain	26248	100%
Were Narcotics Administered/ Ordered or Provided		
Yes	10,463	39.9
No	15,785	60.1
Age		
<12 years	2362	9.0
13- 24 years	5334	20.3
25 to 24 years	4925	18.8
35 to 44 years	4749	18.1
45 to 59 years	4876	18.6
60 or older	4002	15.2
Sex		
Male	11,463	43.7
Female	14,785	56.3
Race		
Black	5951	22.7
White	19,442	74.1
Other	855	3.3

	Number of Patients	% of total
Patient Ethnicity		
Hispanic or Latino	3272	12.5
Non-Hispanic / Latino	22976	87.5
Method of Payment		
Private	10,153	40.5
Medicare	3573	14.3
Medicaid	5373	21.4
Workers Comp	621	2.5
Self-pay	4373	17.5
Other	2155	3.8
Alcohol Use by Patient		
Yes	439	1.9
No	22,961	98.1
Work Related Injury or Illness		
Yes	973	3.7
No	24,040	91.6
*Those blank or Unknown were Excluded		
Top Three Reasons or Visit		
Musculoskeletal Disorders or Complaints	5657	21.6
Injuries	4976	19.0
Digestive Disorders or Complaints	4541	17.3

Geographic Region		
Northeast	3380	22.3
Midwest	3215	21.2
South	5719	37.7
West	2860	18.8
Top Three Diagnosis Categories		
Injuries or Poisonings	7840	29.9
Diseases of Musculoskeletal System	5080	19.4
Symptoms, Signs, and Ill-Defined Conditions	2573	9.8
Above percentages are proportion total sample population of 26,248		

Table 2. Crude and Adjusted Odds Ratios with 95 % Confident Intervals for Narcotic Administration or Prescription by Select Patient Characteristics Amongst the Three Most Common Reasons for Visit

	Crude OR	95 % CI		
		Lower -Upper	Adjusted OR	Lower -Upper
Race				
White	1		1	
Black	0.68	0.63 – 0.73	0.66	0.60 - 0.72
Other	0.73	0.60 – 0.87	0.72	0.58 - 0.90
Ethnicity				
Non Hispanic	1		1	
Hispanic	0.82	0.75 – 0.91	0.86	0.76 - 0.97
Age Ranges				
12 or less	1		1	
13 to 24	3.22	2.74 – 3.79	3.17	2.66 - 3.77
25 to 34	4.87	4.14 – 5.73	4.86	4.07 - 5.80
35 to 44	5.89	5.06 – 6.93	5.85	4.90 - 6.99
45 to 59	5.59	4.75 – 6.57	5.67	4.75 - 6.77
60 or older	4.9	4.15 – 5.80	5.01	4.10 - 6.12
Payment Method				
Private	1.00		1	
Medicare	1.17	1.06-1.30	0.92	0.80 -1.06
Medicaid	0.82	0.75 – 0.90	0.94	0.85 -1.05
Workers Comp	1.07	0.90 – 1.28	1.03	0.77 -1.38
Self Pay	1.08	0.98 – 1.19	1.08	0.97 -1.20
Other	0.85	0.71 – 1.01	0.83	0.68 -1.01
Work Related				
No	1		1	
Yes	1.04	0.91 – 1.20	0.89	0.70 - 1.12
Alcohol Use				
No	1		1	
Yes	0.66	0.52 – 0.85	0.66	0.50 - 0.88

Reasons for Visit	Crude OR	Lower -Upper	Adjusted OR	Lower -Upper
Musculoskeletal	1		1	
Injury	0.66	0.61 – 0.71	0.75	0.69 - 0.82
Digestive	0.82	0.76 – 0.89	0.83	0.76 - 0.90
Region				
Northeast	1		1	
South	1.67	1.48 – 1.81	1.68	1.50 - 1.88
Midwest	1.63	1.53 – 1.82	1.73	1.57 - 1.92
West	2.27	2.05 – 2.51	2.26	2.00 - 2.55

Table 3. Crude and Adjusted Odds Ratios with 95 % Confident Intervals for Narcotic Administration or Prescription by Select Patient Characteristics Amongst the Three Most Common Diagnoses

		95 % CI		95 % CI
	Crude OR	Lower -Upper	Adjusted OR	Lower -Upper
Race				
White	1		1	
Black	0.65	0.60 – 0.71	0.61	0.56 - 0.67
Other	0.69	0.57 – 0.84	0.7	0.56 - 0.87
Ethnicity				
Non Hispanic	1		1	
Hispanic	0.91	0.81 – 1.00	0.92	0.82 - 1.05
Age Ranges				
12 or less	1		1	
13 to 24	3.12	2.65 – 3.67	3.16	2.65 - 3.77
25 to 34	4.92	4.18 – 5.79	5.15	4.31 - 6.16
35 to 44	5.61	4.78 – 6.61	5.92	4.96 - 7.07
45 to 59	5.48	4.67 – 6.44	5.96	5.00 - 7.11
60 or older	4.44	3.76 – 5.24	4.78	3.93 - 5.82
Payment Method				
Private	1.00		1	
Medicare	1.11	1.01-1.22	0.95	0.83 - 1.08
Medicaid	0.9	0.82 – 0.98	1.05	0.95 - 1.16
Workers Comp	1.1	0.92 – 1.30	0.97	0.73 - 1.29
Self Pay	1.06	0.96 – 1.16	1.01	0.91 - 1.13
Other	0.84	0.70 – 1.00	0.79	0.64 - 0.97
Work Related				
No	1		1	
Yes	1.09	0.96 – 1.25	0.89	0.70 - 1.12
Alcohol Use				
No	1		1	
Yes	0.8	0.62 – 1.04	0.7	0.53 - 0.93

Diagnosis	Crude OR	Lower -Upper	Adjusted OR	Lower -Upper
Injuries	1		1	
Musculoskeletal	1.64	1.50 – 1.80	1.35	1.22 - 1.50
Ill-defined	0.92	0.85 – 0.99	0.76	0.70 - 0.82
Region				
Northeast	1		1	
South	1.71	1.56 – 1.86	1.67	1.49 - 1.87
Midwest	1.63	1.48 – 1.80	1.79	1.62 - 1.98
West	2.28	2.06 – 2.52	2.26	2.01 - 2.55

Conclusion and Discussion

Disparities in health care delivery are widespread on many levels. Most commonly targeted or affected are minorities such as Blacks or ethnic groups. While most studies that are conducted on disparities target issues such as access to health care or drug cost, less has been focused on studying disparities in such topics as narcotic use.

From the results of this study it appears that Blacks with moderate to severe pain, on the whole, were less likely to receive narcotic analgesic medication as compared to their White counterparts. While many may argue that this type of disparity is most likely due to differences in factors such as ability to pay or type of diagnosis, both these factors, along with many others were controlled for in our multivariate analysis with the results remaining the same.

Not included in this report were an additional six regression models that looked at the top diagnoses or reasons for visit individually. The results for these were similar, so the data are not shown. In all models, the most prominent results or interactions were those between race and the prescription or administration of narcotic medications. Blacks were less likely to receive narcotic medications than were White individuals in all models.

Tamayo hypothesized that disparities in opioid analgesic prescribing practices would be less for conditions with clear objective findings as compared to those that were more subjective such as

back pain or migraines.²¹ In fact their conclusion that race and ethnicity per se does not appear to directly effect a physicians predisposition to prescribe opioid analgesics is based on the hypothesis that the disparity lies more in the physicians evaluation and subsequent diagnosis of the patient, the point in healthcare delivery they feel is influenced by race and ethnicity. While this may have been what their study concluded, our study found that Blacks in general were far less likely to receive narcotic prescription for any of the same diagnosis or the same reason for visit. Interestingly since both diagnosis and the decision to prescribe narcotic medications are usually conducted by the same individual, combining or stratifying individuals with the same diagnosis strengthens the idea that it is unlikely that disparities are due to problems within the diagnosis making arena. Instead the actual decisions or thought processes that go into the decision to prescribe narcotics are more likely the culprit that needs to be further explored.

Many previous studies introduce theories as to why racial or ethnic differences in analgesic prescribing practices may occur. Studies suggest that that physicians, much like the general population, may view minorities less favorably.^{22,23} This may affect the overall prescribing of narcotic analgesics in two ways. First, physicians may be less likely to prescribe narcotic analgesics to persons seeking them for secondary gain. Second, while viewing patients less favorably, physicians may be inclined to interact with patients in different ways, resulting in altered patterns of diagnosing potentially painful conditions, which would later affect treatment and prescribing patterns.

Other factors may also play a role in the physician's perception of the patient, which may affect prescribing patterns. In fact Van Ryan and Burke found that socioeconomic status was oftentimes associated with a physician's perception of a patient's abilities, personality, and

behavior.²⁴ Though not fully explored, this study failed to show that these types of perceptions had any effect on the prescription or administration of narcotics. In this aspect, however, our study was greatly limited by the fact that the only real socioeconomic indicator included in our model was method of payment. In addition, while there are enormous differences in socioeconomic status across racial and ethnic groups in the United States, it may in fact be physicians' perceptions of an individual's socioeconomic status based on race or ethnicity alone that may in fact be the effecting treatment. In this regards stereotypes or false inferences of a person's ability to pay for services based on race or ethnicity may be the real culprit as compared to their actual skin color or ethnic origin.

Other stereotypes or associations, such as the idea that an African American or Hispanic is more likely to lack a regular source of care may also affect the association as well. While this may be true in many cases, a White individual or non-Hispanic may in fact be just as poor or lack the resources as well. Thus as Tamayo concludes, racial and ethnic differences may arise not because of race/ethnicity per se, but because of the large disparities in socioeconomic status and access to health care that exist in our country that are associated with race and ethnicity.²⁵

From this study as well as from others, it is apparent that the frequency of prescription of narcotic medications amongst the U.S. population is in fact dependent on numerous inherent and environmental factors. In order to determine where the disparities originate will most likely require broader and longer term studies that incorporate many different clinical and social study disciplines. While studies like this, that are limited to a few easily measured variables, may, in fact, be able to offer general ideas as to the pattern of these disparities, they fall short in being able to pinpoint the reasons for these disparities.

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