

AN EXPLORATION OF RACIAL BIAS IN MEDICAL STUDENTS' PAIN PERCEPTIONS AND TREATMENT DECISIONS

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Health disparities among various racial and ethnic groups are prevalent in the United States, in part because racial and ethnic minorities often receive substandard medical treatment compared to White patients (for a general review, see Smedley et al.). One such disparity is in the treatment of pain for Black and White patients. The experience of pain is a major determinant of one's quality of life and effectively treating pain can substantially improve that quality of life.¹ Research has consistently shown, however, that pain assessment and pain treatment are often poorer for racial and ethnic minorities in comparison to non-Hispanic Whites (for general reviews of this area of research, see Cintron and Morrison, as well as Green et al.). For example, in a retrospective study of pain treatments for 99,903 U.S. veterans, Black patients were significantly less likely to receive a prescription for opioids than were White patients.² Disparities in pain perception and treatment are found across all medical settings, such as postoperative care and emergency medicine, as well as across various types of pain associated with both acute and chronic illnesses.³ To make matters worse, there is evidence that minority groups actually have a lower pain threshold, lower pain tolerance, and higher pain ratings than White people (for a general review of this research, see Rahim-Williams

¹ Niv and Kreitler, "Pain and quality of life," 155.

² Burgess et al., "Racial differences in prescription of opioid analgesics," 451.

³ Green et al., "The unequal burden of pain," 288.

et al. and Kim et al.). Thus, members of racial minority groups appear to suffer pain more severely yet are treated for pain less aggressively.

Health professionals and social scientists have been exploring possible explanations for why the racial disparity in pain treatment exists. For example, pain treatment disparities may exist due to racial stereotypes and faulty biological beliefs held by medical professionals. In a study by Hoffman et al., over half of the 222 medical students and residents they studied accepted as true at least one faulty statement regarding biological differences between Blacks and Whites, including Black individuals having less sensitive nerve endings and thicker skin than White people.⁴ Moreover, the medical students and residents who held these faulty beliefs subsequently showed a racial bias in that they judged the pain of Black individuals to be less than the pain of White individuals.⁵ This study reveals the effects of racial stereotypes on pain perception and treatment, which contributes to the persistent undertreatment of Black patients in the United States.⁶ In addition to biologically-based stereotypes, false beliefs regarding the life hardships faced by racial minorities can distort pain perceptions. Specifically, many individuals believe that hardship leads to toughness (“what doesn’t kill you, makes you stronger”), and toughness leads to greater pain tolerance. As a result, minority groups who are assumed to have more life hardships are assumed to have a greater pain tolerance.⁷ In this study, we attempt to replicate existing research on differences in medical students’ perceived pain tolerance and pain sensitivity of Black and White individuals. We expand upon prior research by examining perceptions of pain tolerance and pain sensitivity for other racial and ethnic minority groups. Additionally, more sensitive measures are used to judge pain tolerance and pain sensitivity than in previous studies. Previous research has examined differences in the prescription of narcotics (opioids) for pain treatment in Black and White individuals; however, no research has been conducted to examine the manner in which the treatment is administered. We examined two decisions in regard to treatment: which treatment for postoperative pain was given (narcotic vs. non-narcotic) and how that treatment was delivered (patient-controlled vs. other-controlled). Patient-controlled treatments

⁴ Hoffman et al., “Racial bias in pain,” 4299.

⁵ Ibid.

⁶ Ibid.

⁷ Hoffman and Trawalter, “Assumptions about life hardship,” 492.

are defined as any mechanism by which the patient can self-administer small doses of pain medication. Other-controlled treatments are defined as traditional methods of dispensing pain medication in which the timing and amount of medication is under a medical professional's control. Patient-controlled treatment is one of the most effective pain control methods, and patients report less pain and higher satisfaction when given this option.⁸ Consistent with previous research on this topic, we hypothesize that participants will judge racial minorities to have a higher pain tolerance and lower pain sensitivity and will be more likely to choose a non-narcotic method of pain control. No prior research has examined racial disparity in pain medication delivery, but research does show that patient-controlled treatment is most effective.⁶ Lastly, we will examine how the extent of medical training influences survey responses and treatment decisions.

Method

Participants

Participants were 89 medical students (39 men, 50 women) at a private Midwestern university who were compensated with a raffle entry for a cash prize. Participants ranged from 23 to 32 years of age ($M = 25.5$, $SD = 1.49$). Of the participants, 15.7% of the students completed one year of medical school, 37.1% completed two years, 33.7% completed three years, and 13.5% completed at least four years of medical training. All participants were United States citizens, and 76.4% were White, 11.2% were Asian, 2.2% were Hispanic, 1.1% were Black, and 9.0% were other/multiracial.

Materials and Procedure

Each participant received a survey under the guise of evaluating their knowledge and perceptions of health disparities across racial groups. The survey contained items intended to measure their perceptions of various racial groups relating to health-related behaviors and attitudes, as well as pain tolerance, pain sensitivity and susceptibility to certain medical conditions. The particular items of interest in this section included two questions regarding pain tolerance

⁸ McNicol, Ferguson, and Hudcova, "Patient controlled opioid anesthesia."

and pain sensitivity of several racial groups. Participants were specifically asked "What is the pain tolerance (i.e., the level or amount of pain a person can tolerate or endure without requiring relief) for the average member of each of the following groups?" Their responses ranged from 1 (much lower than average) to 7 (much higher than average). The racial and ethnic groups of interest included American Indian/Alaska Native, Asian, Black/African-American, Hispanic/Latino, Native Hawaiian/Pacific Islander, and White/Caucasian. Using the same scale, participants also rated each of these groups with regard to pain sensitivity and were specifically asked "What is the pain sensitivity for the average member of each of the following groups?" We noted that high sensitivity means very little stimulation is required before a sensation is experienced as painful, whereas low sensitivity means a great deal of stimulation is required before a sensation is experienced as painful. The midpoint of these scales was a value of four and was specifically labelled as being the same as the national average.

The final section of the survey included a description of a hospitalized male patient who had undergone orthopedic surgery for a femoral fracture incurred during a car accident. All participants received the identical description of the patient and the accident, but half of the participants received this passage with a traditionally White name (Mr. Jake Olson), while the other half received the description with a traditionally Black name (Mr. Darnell Washington). The patient was described otherwise as in good general health, not taking any prescription medications, and having no contraindications for treatment options used for acute pain. Participants were asked to choose a method of pain control for the patient, some of which were patient-controlled narcotic treatments (e.g., drug delivered via a patient-controlled intravenous pump), while others were other-controlled narcotic treatments (e.g. oral narcotic pill), as well as non-narcotic options (e.g. oral anti-inflammatory pill or hot/cold compresses).

Results

Medical students perceived significant differences in pain tolerance across the six racial and ethnic groups included in our survey, $F(5, 440) = 20.88, p < .001$. As indicated in Table 1, participants consistently judged White individuals to have a below average level of pain tolerance while racial minorities were consistently judged to have an above average level of pain tolerance. We conducted a planned

contrast that indicated that participants judged Whites to have lower pain tolerance compared to the five racial minority groups, $F(1, 88) = 54.12, p < .001$. As expected, perceived pain sensitivity showed the opposite pattern. Medical students perceived significant differences in pain sensitivity across all groups $F(5, 440) = 12.45, p < .001$. Additionally, planned contrast revealed that Whites were judged as significantly more pain sensitive in comparison to all five minority groups $F(1, 88) = 23.64, p < .001$.

Table 1

Medical Students' Perceptions of Pain Sensitivity and Pain Tolerance for Six Racial Groups

	Pain Sensitivity		Pain Tolerance	
	Mean	Std. Deviation	Mean	Std. Deviation
American Indian	3.66 _a	.85	4.63 _b	.98
Asian	4.08 _a	.63	4.18 _a	.79
Black	3.79 _a	.80	4.38 _b	1.02
Hispanic/Latino	3.89 _a	.80	4.33 _b	.97
Pacific Islander	3.92 _a	.61	4.19 _b	.71
White	4.43 _b	.80	3.43 _a	.78

Means with different subscripts within each group are significantly different ($p < .05$)

Note: For both pain sensitivity and pain tolerance, 4.00 = average

We next examined participants' treatment decisions for the scenario we posed to them to determine whether there was a difference in treatment for Black and White patients undergoing acute postoperative pain. We first examined whether there was a difference in choosing to prescribe narcotic medication or non-narcotic treatment. As can be seen in Table 2, narcotic drug treatment for acute postoperative pain was most frequently chosen, but there was no significant difference as a function of patient's race, *Cramer's V* ($N = 89$) = .018, $p = .87$. Contrary to general findings, we did not find a discrepancy based on race in the prescription of narcotic versus non-narcotic treatment. To examine the second question, we only focused on individuals who chose to give a narcotic medication following surgery. In this analysis, a function of the patients' race emerged. As can be seen in Table 3, the patient-controlled narcotic treatment option was chosen

significantly less often for Black patients than for White patients, *Cramer's V* ($N = 58$) = .291, $p = .027$. For both judgments of pain tolerance and pain sensitivity, as well as for the treatment decisions we asked the medical students to make, the number of years of medical training they had completed had no significant effect. Thus, students who had received four years of medical training were just as likely to exhibit these biases as students who had received only one year of medical training.

Table 2

Medical Students' Post-Operative Pain Treatment Choices as a Function of Patient's Race

	Narcotic (Opioid)	Non-Narcotic
Black Patient	27 (64.3%)	15 (35.7%)
White Patient	31 (66.0%)	16 (34.9%)

Table 3

Medical Students' Narcotic (Opioid) Delivery Choices as a Function of Patient's Race

	Patient-Controlled	Other-Controlled
Black Patient	21 (77.8.3%)	6 (22.2%)
White Patient	30 (96.8%)	1 (3.2%)

Discussion

The findings of this study are consistent with previous research regarding racial bias in medical treatments towards racial minorities. As expected, medical students judged Whites to be less pain tolerant and more pain sensitive, but generally judged minorities to be more pain tolerant and less pain sensitive. The strength of this effect, however, varied across minority groups. This effect was particularly strong for the American Indian, Black/African-American and Hispanic/Latino groups, and weaker for the Native Hawaiian/Pacific Islander group. In contrast, judgments of Asians' pain tolerance and pain sensitivity were remarkably similar and did not differ significantly

from average. This exception may be due to different stereotypes about Asians. For example, Asians may be perceived as more successful and experiencing less hardship.⁷ Because of the implicit association with less hardship resulting in less tolerance to pain, Asians may be viewed as less pain-tolerant.⁸ Furthermore, Asians are often perceived as more feminine than other racial groups.⁹ This effect may also be due to the general perception of Asians having lighter skin tones and therefore are perceived as more similar to Whites than other minority groups.

With regard to treatment options, we found no difference in the likelihood of choosing narcotic pain medication for Blacks or Whites. However, our scenario was a situation in which pain was not ambiguous and where narcotic treatment is considered standard; racial bias is less likely to emerge in these circumstances.¹⁰ Future research may examine more ambiguous situations, such as in situations of follow-up visits and chronic pain, rather than immediately following a surgery. Interestingly, we did find a difference in preferences of administration method of narcotic medication to the patient. Black patients were less likely to be given a patient-controlled narcotic option, whereas White patients were almost always given that option. The use of self-administered medication is highly correlated with satisfaction with healthcare and success in managing pain.¹¹ Additional research should examine this potential health disparity in pain treatment delivery in actual patients. Though it is concerning that these future medical practitioners exhibited these biases, research indicates that medical education regarding pain management is often poor or inadequate.¹²

These pain treatment biases are likely to be implicit and thus unconsciously affect providers' judgments and decisions.¹³ A first step towards reducing these health treatment disparities is to make medical providers aware of their implicit biases. To improve medical providers' understanding of discrepancies in pain and the sociopsychological

⁹ Wong et al., "Asian-Americans as a Model Minority."

¹⁰ Hoffman and Trawalter, "Assumptions about life hardship," 492.

¹¹ Galinsky, Hall, and Cuddy, "Gendered Races," 500.

¹² Hirsch et al., "The interaction of patient race," 558.

¹³ McNicol, Ferguson, and Hudcova, "Patient controlled opioid anesthesia."

¹⁴ Yanni et al., "Preparation, Confidence and Attitudes," 262.

¹⁵ Zescott, Blair, and Stone, "Examining Implicit Bias," 530.

factors that affect pain perception, curricula in medical training can heighten the awareness of these implicit biases by explicitly addressing the social and psychological factors that affect pain perception and treatment. However, awareness alone has not been found to be sufficient and changing this habit of mind requires acknowledging these biases and working towards eliminating them.¹⁴ Research has found perspective-taking exercises to be effective with respect to clinical pain treatment.¹⁵ These and other exercises could be implemented in medical education as well as continuing education requirements to help medical students and practitioners recognize their own biases and practice strategies for reducing them. There is no easy solution to this issue, but by incorporating promising strategies and continuing to assess their effectiveness, we can move towards greater equality in health outcomes for all.

¹⁶ Chapman, Kaatz, and Carnes, "Physicians and implicit bias," 1508.

¹⁷ Drwecki et al., "Reducing racial disparities," 1005.

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