Retrospective Study

Assessment of Patent Diversity and Equity of Care in a Tertiary Referral Interventional Pain Medicine Clinic

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Objective: As an academic tertiary care interventional pain clinic, referrals are screened to ensure patients most likely to benefit from our services are accepted into the practice. The objective of this study is to assess for unconscious bias in the patient selection process.

Study Design: The demographic data of patients accepted into the practice was compared to patients not offered an appointment as a result of the screening process.

Setting: A university-based interventional pain center seeing patients referred from within the institution and broader community.

Methods: Three data management systems including an electronic health record, an appointment management system, and a financial records system, were queried to extract the patient characteristics and demographic data for all patients referred to the clinic between January 1, 2018, and December 31, 2019. Data were then analyzed for differences across these demographic characteristics to assess for unconscious bias.

Results: There were 3,465 patients meeting the criteria; 2975 were offered an appointment and 490 were not. The ages and genders were not clinically different between groups. There was a significant difference in the percentage of patients identifying as Hispanic being offered an appointment (1.82%) vs not being offered an appointment (3.88%) ($P = 0.0016$). There were no statistical differences in the race or preferred language of patients accepted for an appointment versus declined.

Conclusions: While the screening process did not result in disparities across age, gender, race, or language preference, there was a statistical difference in patients identifying as Hispanic. As a result of this study, all patient identification has been removed from the review document to limit the likelihood of unconscious bias.

Key words: Diversity, racial and ethnic disparities, interventional pain medicine

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Chronic pain impacts over 100 million adults across the United States and is a leading cause for medical care (1). Unfortunately, racial and ethnic minority status are known risk factors for the under-treatment of pain in the United States. Previous research addressing disparities in pain management has shown that across a variety of clinical settings, including emergency departments, inpatient, and outpatient settings; racial and ethnic minorities are less likely to receive treatment for chronic pain (1). Furthermore, minority patients are at greater risk for under-assessment of their pain and are more likely

to experience a delay in access to pain specialists (2). Racial and ethical minority patients receive lower doses of pain medications, are less likely to receive opiates at all, and experience undertreatment of pain while in hospice care in comparison to their white counterparts (3). Unfortunately, most clinicians are undertrained and uncomfortable with treating patients with chronic pain in general (4,5). Add to this the unconscious bias towards ethnic and racial minorities, and the disparities in pain care are amplified (6).

As an interventional-based pain medicine clinic, our primary goal is to provide interventional services to patients referred from within the institution and broader community. Since we are unable to meet the entire demand, a review process has been put in place to assess referrals' appropriateness for interventional procedures. A physician within the practice reviews all incoming referrals; this process is shared across physicians within the practice. The criteria reviewed include the patient's diagnosis, reason for referral (interventions versus medication management), and review of the prescription drug monitoring program data (PDMP). Use of the PDMP is allowed in the state of Kentucky if used for the purpose of care for a prospective patient (7).

Elimination criteria would include: a diagnosis not amenable to interventional pain care such as fibromyalgia, requests for treatment not provided such as high dose opioid management, or PDMP data which documents high dose opioids or opioids from multiple providers within the last year. It is well understood within the institution that if a referring provider feels extenuating circumstances exist, or there is a specific request, they can easily ask for reconsideration.

The primary aim of our study was to compare patient demographics of referrals accepted verses rejected to evaluate for unconscious bias. The second aim was to compare the demographics of patients accepted to those of University of Kentucky HealthCare (UKHC) to assess unconscious bias within our referring providers. Finally, we implemented new steps to limit unconscious bias while continuing to maximize access for patients most likely to benefit from injection pain care.

Methods

The University of Kentucky Institutional Review Board (IRB) approved this retrospective study (IRB #62111). The project described was supported by the University of Kentucky HealthCare Performance Analytics Center of Excellence (PACE).

A comprehensive search of 3 independent databases was performed to identify all new patients referred to University of Kentucky Interventional Pain Medicine (UKIPM) between January 1, 2018, and December 31, 2019. Databases included Allscripts Touchworks Electronic Health Record (AEHR), Allscripts (Chicago, Ill), the electronic medical record used in our ambulatory clinic environments, Allscripts Practice Management (APM), Allscripts (Chicago, Ill), the database used for patient appointment information, and HealthQuest Patient Management (HQPM), McKesson (Irving, TX), the revenue management tool used by UKHC, were queried.

Patients included in this study were referred to UKIPM, resided in Kentucky counties that make up the UKHC catchment area, and were aged 18-80 years of age at the time of referral. The age range was chosen by PACE due to extraction issues. The data set was then reviewed for duplicate medical record numbers and completion of missing data such as zip code or county of residence.

The demographic and patient characteristics of this group were extracted to include age, patient's stated gender, marital status, employment status, preferred language, race, ethnicity, pain diagnoses, reason for referral, pain score at time of referral, and medications prescribed at initial visit if seen at UKIPM. Then this large cohort was divided between those patients offered an appointment and those not receiving an appointment after the review process (Fig. 1).

Group I included all patients that were referred and offered an appointment. Group II included all patients referred but not offered an appointment after screening. Group III included all patients seen at UKHC in the ambulatory population during this 2-year time period.

Since not all patients in Group I were seen due to failure to keep appointments or other typical scheduling issues, a subgroup analysis was performed on Group I, which represented patients referred and seen at UKIPM and labeled Group IV.

Demographic statistical analysis was performed using SAS version 9.4 (Cary, NC) among Group I, Group II, Group III, and Group IV. Significant differences were tested using chi-square or t-test analysis based on different type of data (i.e., continuous data using t-test, categorical data using chi-square test). Group IV data statistical analysis is based on the output of medications prescribed to patients seen and treated at UKIPM. Due to imbalanced data distribution among different

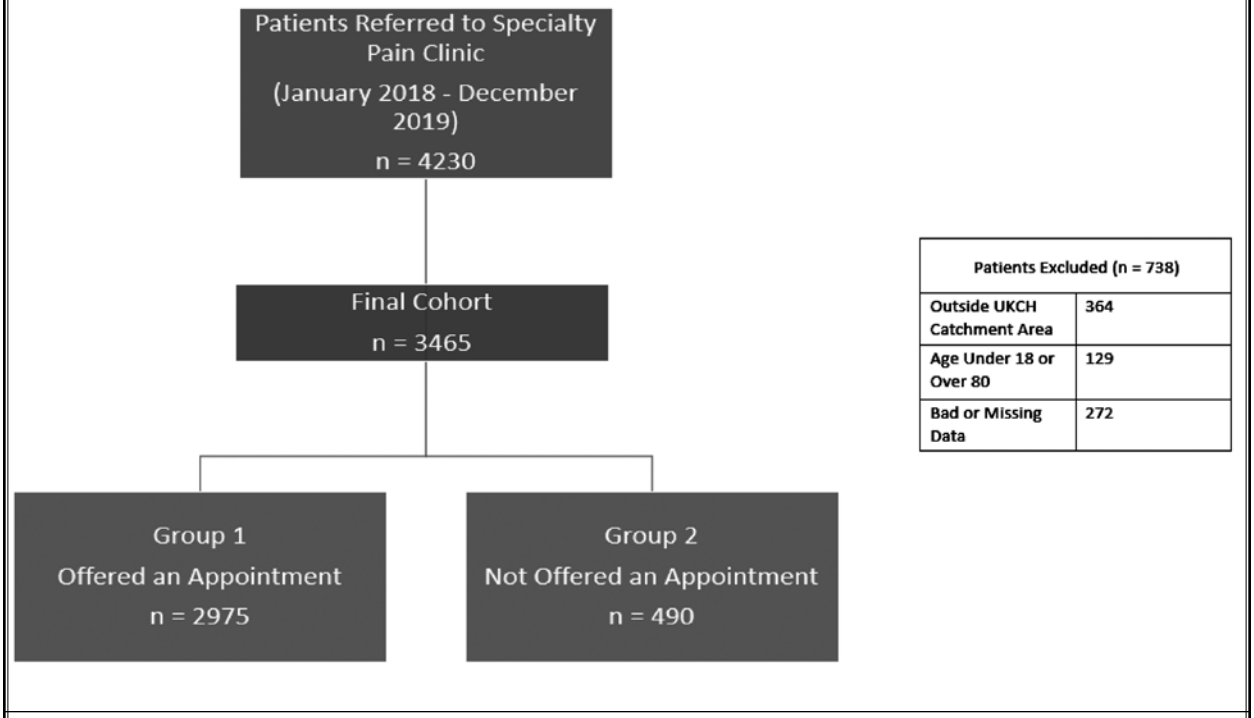

Fig. 1. *Workflow to obtain patient groupings.*

medications used, the test of the proportional odds assumption for ordinal logistical regression method is significant, which cannot meet the prerequisite condition of using this method. Instead, statistical methods were applied, including Wilcoxon-Mann-Whitney test (categorical variable with 2 levels: county, gender, language, employment), Kruskal Wallis test (categorical variable with 2 more levels: race, ethnicity, marital status, diagnosis, economic status), and non-parametric correlation (continuous variable: Body Mass Index [BMI], weight, height, Visual Analog Scale [VAS] score, age, days from referral to visit, total appointment times with UKIPM).

Results

A total of 4,230 patient referrals were identified. The data set was screened, and referrals from outside the UKHC catchment area (364) and patients aged less than 18 or greater than 80 (129) were removed. Patients with bad or missing data (272) were excluded. This left a total of 3,465 referrals meeting inclusion criteria. Group I, patients offered an appointment was 2975, and Group II, patients not offered an appointment was 490. Group III, all UKHC ambulatory patient population was 260,392. Group IV, patients actually seen at UKIPM was 2186 (Fig. 1).

The average age of Group I (53.47) versus Group II (53.02), while statistically significant ($P < 0.001$), was not clinically significant. Group III (47.46) was significant ($P < 0.0001$) compared to Group I (Fig. 2).

The identified gender of patients in Group I were 58.22% women and 41.78% men. Group II was 57.76 women, and 42.24% men was not statistically significant ($P = 0.8797$). Group I versus Group III was significant ($P = 0.0035$) (Fig. 3).

The population identifying as Hispanic in Group I was 1.82%, while Group II was 3.88% ($P = 0.0016$). Group III was 3.37% compared to 1.82% of Group I ($P < 0.0001$). For non-Hispanics, those offered an appointment were 98.18%, while those not offered an appointment were 96.12% ($P = 0.0016$). The percentage of the UKHC population, Group III, that identifies as non-Hispanic was 96.63% compared to Group I at 98.18%% ($P < 0.0001$) (Fig. 4).

There was no statistical difference in racial distribution between Group I versus Group II for Asians, 0.84% versus 0.82%, Black/African American 11.06% versus 9.59%, white 85.58% versus 87.96%, and other 2.52% versus 1.63% respectively ($P = 0.4418$). There was statistical difference in the racial makeup of Group I vs Group III; Asian 0.84% vs 1.85%, Black/African Ameri-

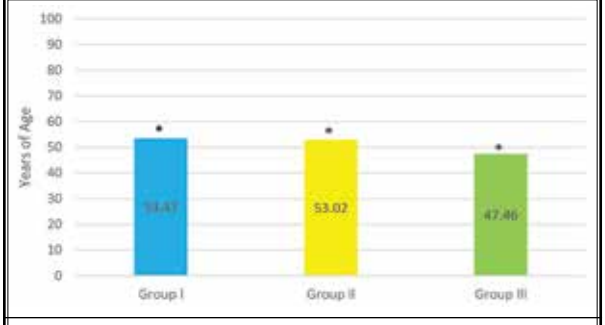

Fig. 2. *Average age.*

Fig. 3. *Gender breakout.*

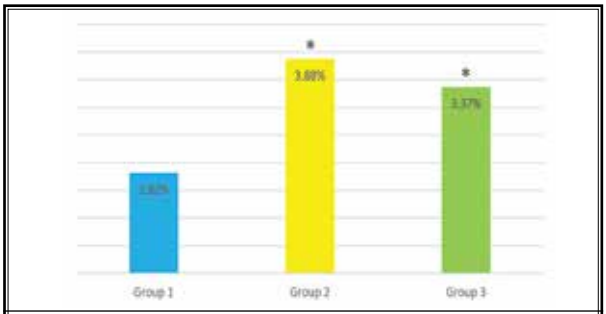

Fig. 4. *Percentage of self-identified Hispanics.*

can 11.06% vs 9.02%, white 85.58% vs 85.58%, and other 2.52% vs 3.56%, respectively ($P < 0.001$) (Fig. 5).

In the population identifying a preferred language other than English, 3.09% made up Group I, and 4.29% made up Group II ($P = 0.195$). Group I versus Group III (6.08%) was statistically significant ($P < 0.0001$) (Fig. 6). There was no statistical difference in preferred language across Groups I, II, and III, 96.91%, 95.71%, and 93.92%, respectively.

In the subgroup analysis of referred patients actually seen, Group IV (n = 2186), there was no statistical difference in the prescribing of opioids, benzodiazepines (procedural sedation only), or adjuvant medication for Hispanic versus non-Hispanic populations ($P = 0.093$). There was no difference in medication type, strength, or daily dosing. Across racial groups, there was no difference in prescribing for Asian, Black/African American, White, and others for opioids, benzodiazepines (procedural sedation only), or adjuvants ($P = 0.4638$). Moreover, there was no difference in medication type, strength, or daily dosing (Fig. 7).

Discussion

Healthcare providers strive for unbiased care; however, unconscious bias is well documented within the realm of health care. Most providers believe that stereotypes and bias do not affect their treatment decisions and thus rarely recognize their own discrepancies within medical decision-making (8). This unconscious bias in clinical decisions results in large disparities and discrepancies in care. Green et al (9) reported that among physicians stating "no explicit preference" in caring for black vs white patients, there was still documentable unconscious selection against treating black patients and a preference for treating white patients. Moreover, physician favoritism resulted in more treatments being offered to white patients while simultaneously few treatments being offered to black patients (9).

In our study, comparison of Groups I and III shows the differences in patient characteristics and demographics between the populations of patients offered an appointment at UKIPM and the population of UKHC. It does not indicate whether there has been a bias in the review process. To achieve this, Groups I and II need to be compared. There was a statistical difference in the referral group receiving an appointment (1.82%) versus the group not receiving an appointment (3.88%) in those identifying as Hispanic. However, this difference was also present between the group offered an appointment (1.82%) and UKHC (3.37%). Interestingly, this difference was not seen between Group II (3.88%) and the total UKHC ambulatory population (3.37%). While the exact cause of this discrepancy is unknown, it could indicate bias in the review process. There may be confounding factors contributing to the perceived ethnic selection bias, such as lack of financial assistance, healthcare insurance, or access to mental health, which resulted in the patients being routed to a pain clinic instead of a more appropriate referral.

There is no statistical difference between Groups I and II for age, gender, race, or language. In fact, there was a higher percentage of Asians, and Black/

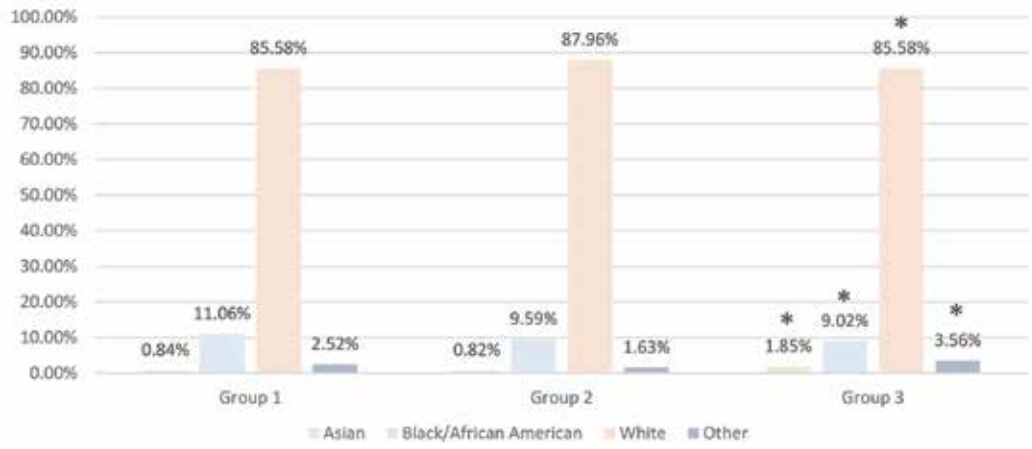

Fig. 5. *Percentage by self-identified race.*

African Americans in the referral group offered an appointment than in the referral group not offered an appointment. However, there were statistical differences in the percentage of Asian and Black/African American patients receiving appointments at UKIPM and the population of UKHC as a whole. This may indicate unconscious bias in pain assessment, treatment and the referral processes already well documented the literature. Finally, in the subgroup analysis (Group IV) for patients seen at UKIPM, there were no differences in prescribing rates for opioids, adjuvants, or single-use benzodiazepines for sedation across gender, ethnic, or racial groups.

One weakness of our study is the Group III data. These data were provided by PACE as part of UKHC but does not represent the actual demographics of the referral area but rather only represents the demographics of patients seen at UKHC. As an advanced interventional clinic offering procedures not performed in the community or surrounding areas, we receive referrals from groups that do not refer to UKHC for other types of care. This could affect the demographic distribution of Group I data compared to that of Group III.

As a result of these findings, the review process has been revamped, and all possible identifying information has been blinded to the reviewer. Now, only the PDMP data, diagnosis, and reason for referral are provided to the reviewer. Given the understanding and appreciation for cultural differences in pain presentation, description, and beliefs across race and ethnicity, we are reaching out to our referral partners to educate them on the differences in pain presentations across

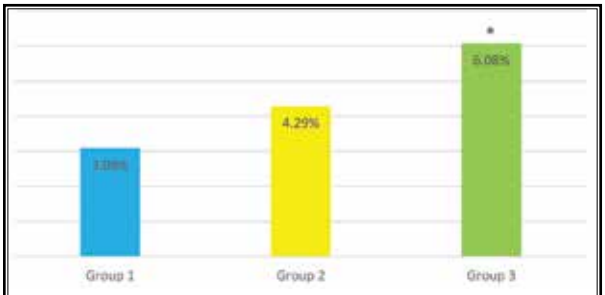

Fig. 6. *Percentage preferred language other than English.*

different cultures. Finally, we are emphasizing these same competencies with our pain fellowship to ensure that the next generation of pain medicine physicians are better equipped to identify and treat pain across a broad range of cultural backgrounds.

With this understanding of our current cultural successes and areas for improvement, we hope to implement a follow-up study to assess the efficacy of our changes in referral review. As our cultural landscape continues to evolve, pain remains a universal human experience. As a result, we need to ensure pain care is available to all communities and, as such, should begin to incorporate perceptions and experiences of pain treatment in other marginalized populations, such as the LGBTQ+ population. Pain does not know wealth, gender, color, race, ethnicity, or preference. It is our moral imperative to ensure all groups receive care for not only reducing their pain but standardizing equitable care for all individuals.

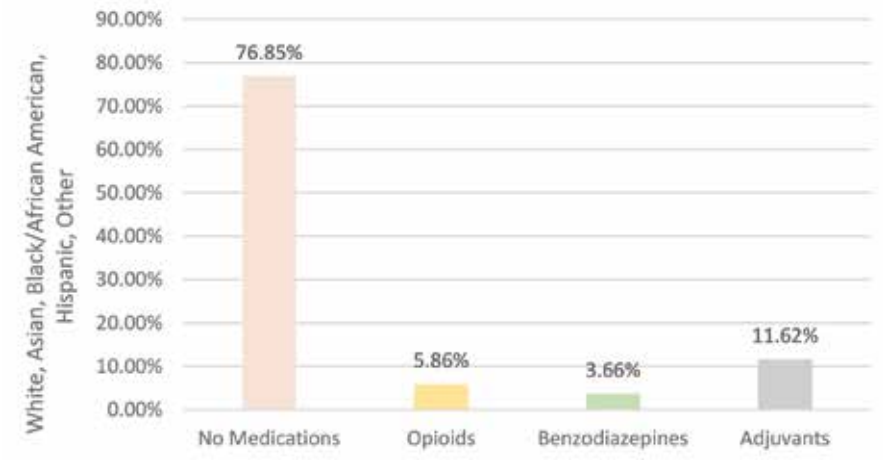

Fig. 7. *Medication prescribed compared across race.*

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