

2023

Racial disparities in access to pain management services during COVID pandemic at an urban safety-net hospital

Mohammad Ghorbanhoseini
Emory University, dr_ghhoseini@yahoo.com

Akhil Venkat Uppalapati
Boston University School of Medicine, auppalap@bu.edu

Allen Yang
Boston University School of Medicine, yangallenc@gmail.com

rafael ortega
Boston University School of Medicine, rafael.ortega@bmc.org

eduard vaynberg
Boston University School of Medicine, eduard.vaynberg@bmc.org

Follow this and additional works at: <https://scholar.rochesterregional.org/advances>



Part of the [Medical Humanities Commons](#)



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](#)

Recommended Citation

Ghorbanhoseini M, Uppalapati AV, Yang A, ortega r, vaynberg e. Racial disparities in access to pain management services during COVID pandemic at an urban safety-net hospital. *Advances in Clinical Medical Research and Healthcare Delivery*. 2023; 3(1). doi: 10.53785/2769-2779.1133.

ISSN: 2769-2779

This Article is brought to you for free and open access by RocScholar. It has been accepted for inclusion in *Advances in Clinical Medical Research and Healthcare Delivery* by an authorized editor of RocScholar. For more information, please contact Advances@rochesterregional.org.

Racial disparities in access to pain management services during COVID pandemic at an urban safety-net hospital

Author ORCID ID:

<https://orcid.org/0000-0001-6477-0133>

Abstract

Background: Race has been identified as one of the great divisions of mankind, associated with differences in healthcare access in the US. The COVID pandemic has shed light on a variety of disparities, including access to pain management services.

Method: All the adult patients who were referred to the pain clinic at Boston Medical Center (BMC) from December 2019- December 2020 were included in this study. A total of 2023 cases (1243 White Race and 790 People of Color) were recruited.

Result: Patients of WR received care at a younger age. COVID-19 increased the average age of WR by 2.5 years, while it didn't affect POC. The average gap between the date of the consult and the procedure was not significantly different between the 2 groups. It also was not significantly different pre-COVID and post-COVID. There were no differences in the racial makeup of the referred patients before and after the pandemic, although the percentage of patients being POC (39.3%) was significantly lower than the racial makeup of the representing population (47.18%). Patients of WR were significantly more likely to have completed visits (66.3%) than POC (60.5%).

Conclusion: Our study demonstrated disparities between the WR and POC that were evident even before starting the COVID-19 pandemic. It also showed that these disparities continued to be the same as before COVID-19. Although many disparities are rooted in the society itself, we noticed that in numerous instances, pain management services were offered equally at our institution. We suggest that multiracial administrative staff living in the same community and hospital-sponsored support systems were the main contributors.

Keywords

Racial disparities, chronic pain management, COVID pandemic, People of color

Creative Commons License



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/)

Conflict of Interest Statement

The authors have no relevant financial or non-financial interests to disclose.

ARTICLE

Racial Disparities in Access to Pain Management Services During COVID Pandemic at an Urban Safety-Net Hospital

Mohammad Ghorbanhoseini ^{a,*}, Akhil V. Uppalapati ^b, Allen Yang ^b, Rafael Ortega ^b, Eduard Vaynberg ^b

^a Emory University, USA

^b Boston University School of Medicine, USA

Abstract

Background: Race has been identified as one of the great divisions of mankind, associated with differences in healthcare access in the US. The COVID pandemic has shed light on a variety of disparities, including access to pain management services.

Method: All the adult patients who were referred to the pain clinic at Boston Medical Center (BMC) from December 2019–December 2020 were included in this study. A total of 2023 cases (1243 White Race and 790 People of Color) were recruited.

Result: Patients of WR received care at a younger age. COVID-19 increased the average age of WR by 2.5 years, while it didn't affect POC. The average gap between the date of the consult and the procedure was not significantly different between the 2 groups. It also was not significantly different pre-COVID and post-COVID. There were no differences in the racial makeup of the referred patients before and after the pandemic, although the percentage of patients being POC (39.3%) was significantly lower than the racial makeup of the representing population (47.18%). Patients of WR were significantly more likely to have completed visits (66.3%) than POC (60.5%).

Conclusion: Our study demonstrated disparities between the WR and POC that were evident even before starting the COVID-19 pandemic. It also showed that these disparities continued to be the same as before COVID-19. Although many disparities are rooted in the society itself, we noticed that in numerous instances, pain management services were offered equally at our institution. We suggest that multiracial administrative staff living in the same community and hospital-sponsored support systems were the main contributors.

Keywords: Racial disparities, Chronic pain management, COVID pandemic, People of color

1. Introduction

Patient's race has repeatedly been associated with healthcare access variability in the United States¹. Many believed COVID-19 would indiscriminately impact individuals regardless of race, sex, or socio-economic background. However, as COVID-19 continues to affect communities around the world, it became apparent that it is anything but the great equalizer². The role of physicians during pandemics is critical to assure equitable healthcare

delivery to all patients regardless of race, age, and gender, particularly when pain management services are required³.

Chronic pain has a significant contribution to healthcare utilization and significantly affects patients' health and well-being⁴. It should be understood that race is a social construct⁵. As a result of systemic racism, people of color, without any demonstrable biological differences, are inextricably bound to lower socio-economic status and, consequently, worse health outcomes⁶. Racial disparities

Received 25 September 2022; accepted 21 November 2022.
Available online ■■■

* Corresponding author.
E-mail address: dr_ghhoseini@yahoo.com (M. Ghorbanhoseini).

<https://doi.org/10.53785/2769-2779.1133>
2769-2779/© 2023 Rochester Regional Health.

in healthcare have been linked to biological and historical factors such as segregation, discrimination, mistrust in the healthcare system, as well as socio-economic and cultural factors⁷. Differences also can be ascribed to variability in physician attitudes and knowledge, as well as in the coverage, access, and utilization of healthcare insurance. The communication gap also remains a significant cause of poor-quality healthcare⁷.

Pain is the chief complaint for 35 million new office visits accounting for over 70 million total annual physician visits⁸. Chronic pain is the most frequent reason for consultation with a physician, and it impacts the overall health and well-being of greater than 65 million Americans⁷. It has been established that people of color receive less acute, chronic, and cancer pain care compared to white race counterparts⁷.

We examined how race impacts access to pain management services at an academic safety-net inner-city hospital during the COVID-19 pandemic, to identify potential disparities and areas in need of improvement.

2. Materials and Methods

Patients referred to the pain clinic at Boston Medical Center (BMC) from December 2019–May 2020 (pre-COVID) and May 2020–December 2020 (COVID), the time COVID became a major state of emergency, were included in this study and their medical records were reviewed retrospectively. Demographic information was collected including age, gender, and race. The time gap (number of days) between the initial evaluation and the planned pain management intervention was chosen as an index to evaluate the ability to timely access interventional pain management treatments. The completion of the pain management procedure was also chosen as an outcome indicator. Unsuccessful appointments were categorized into: canceled, left without being seen, and no shows. The data were divided into 2 groups for analysis: white race patients (WR) and patients of color (POC), and further split into pre-COVID and post-COVID subsequently.

Statistical analysis was performed to identify potential differences between groups using student paired t-test and Pearson's chi-squared test. P-Values of less than 0.05 were considered to be statistically significant.

3. Results

From December 2019 to December 2020, a total of 2023 patients were referred to our institution's pain clinic (1243 WR and 790 POC), and were included in this study.

The average age of the WR was 53.89 years and for POC was 55.19 years, which was statistically significant (P-Value: 0.041).

The patient's average age before and after the beginning of the COVID-19 pandemic was different for WR, but not for POC. The average age in the WR group had a 2.5 years increase from 52.52 years pre-COVID to 54.92 years Post-COVID (P-Value: 0.016). The average age in the POC group was 55.43 years before the onset of the pandemic and 55.01 years afterward (P-Value: 0.606, not statistically important).

Patients were 44.8% male and 55.2% female for the WR; 40.5% male and 59.5% female for POC. The chi-Square analysis did not reveal a significant gender difference between the WR and the POC (Chi-Square: 3.5988, P-value: 0.058). There was also no gender difference among POC before and after the onset of the pandemic. Before the pandemic, 58.4% of POC referred to the pain clinic were females and after the pandemic, 60.3% were females (Chi-Square: 0.4477, P-value: 0.503). There was no gender difference among WR before and after the onset of the pandemic either, 55.3% were females and after the pandemic, 55.1% were females (Chi-Square: 0.0026, P-value: 0.983) (Table 1).

There were no significant differences in the racial composition of the referred patients before and after the pandemic; 60.7% WR pre-COVID and 61.4% post-COVID (P-Value: 0.749). An overview of the patient characteristics is shown in Table 1.

The average number of days between consultation and procedure amongst all patients was 43.8 days before the onset of the pandemic and 49.14 days afterward. This difference was not statistically significant (P-Value: 0.288).

The average gap between initial consult and procedure completion was also not significantly different between WR and POC (Table 2). For WR,

Table 1. Demographics.

	White Race	People of Color	p-value
Age	53.89	55.19	0.041
Before Pandemic	52.52		
After Pandemic	54.92		0.016
Before Pandemic		55.43	
After Pandemic		55.01	0.606
Sex (Overall)			
Male	44.80%	40.50%	0.058
Female	55.20%	59.50%	0.058
Percent Male			
Before Pandemic	44.70%		
After Pandemic	44.90%		0.983
Percentage Female			
Before Pandemic		41.60%	
After Pandemic		39.70%	0.503

Table 2. Gap between appointment and procedure.

	White Race	People of Color	p-value
Overall (days)	44.5	48.6	0.407
Before Pandemic	35.1		
After Pandemic	52		0.014
Before Pandemic		50.6	
After Pandemic		47.3	0.641

this gap was 44.5 days and for the POC it was 48.6 days (P-Value: 0.407).

Notably, among WR, the average gap between consultation and procedure was significantly higher after the pandemic than before (average gap before pandemic 35.1 days and 52.0 days after the pandemic, P-Value: 0.014). This difference was not observed among POC with the average gap before the pandemic being 50.6 days and 47.3 days after the pandemic onset (P-Value: 0.641).

As shown in Table 3, both patients from POC and WR were more likely to have completed visits after the pandemic. The percentage was 64.1% (after pandemic) and 51.9% (before pandemic) for POC (P-Value <0.001); 79.1% (after pandemic) 49.4% (before pandemic) for WR (P-Value <0.001). Overall, WR (66.3%) were significantly more likely to have completed visits than POC (60.5%) with P-Value: 0.008 (Table 4).

4. Discussion

In our study, pre-pandemic WR received care at a younger age possibly due to an earlier referral to the specialist comparing to POC (53.89 years for WR and 55.19 for POC, P: 0.041). COVID increased the average age of WR patients by 2.5 years, while it didn't affect POC (P: 0.016). The reason for that might be that younger patients of WR were more aware of COVID exposure risks thus trying to limit exposures to COVID 19 at a public healthcare facility.

Our analysis showed POC on average were referred to the pain clinic at an age 1.3 older than WR before the pandemic. COVID pandemic eliminated this difference.

Patients of WR were also more likely to have completed visits (WR 66.3%, POC 60.5%, P-Value: 0.008). Canceled appointments, left without being seen, and no shows could be attributed to an array of socio-economic factors, affecting the POC more than WR including limited access to transportation, means of communication, and child care.

No differences were found in the racial makeup of the patients before and after the pandemic, 60.7% WR pre-COVID and 61.4% post-COVID (P-Value: 0.749).

Table 3. Referred patients appointment outcome.

	White Race	People of Color	p-value
Overall	1580	2486	
Canceled	216	356	
Before Pandemic	141		
After Pandemic	75		
Before Pandemic		114	
After Pandemic		242	
Completed	524	752	0.008
Before Pandemic	168		
After Pandemic	356		<0.001
Before Pandemic		191	
After Pandemic		561	<0.001
Left Without Being Seen	5	2	
Before Pandemic	1		
After Pandemic	4		
Before Pandemic		0	
After Pandemic		2	
No Show	45	133	0.008
Before Pandemic	30		
After Pandemic	15		
Before Pandemic		63	
After Pandemic		70	

According to the United States Census Bureau (<https://www.census.gov/quickfacts/bostoncitymassachusetts>), Boston's population in 2020 consisted of 52.82% of whites and 47.18% of people of color or mixed races. That shows a statistically significant difference in race composition between the population of Boston (where our institution is located) and the population of the patients who were referred to our institution's pain clinic (P-value <0.001). This is another confirmation that access to pain management services are not provided equally to patients of different races^{9,10}.

This study didn't reveal any significant difference between the 2 groups in regards to the gap between the time of the initial consult and procedure. COVID also did not have an effect on this variable. This might be explained by the lower socio-economic level of WR patients that usually are seen at the inner-city safety-net hospital.

Structural racism in medicine and medical education continues to hinder our ability to provide the best culturally competent care⁶. In addition to the pre-existing health disparities among marginalized

Table 4. Percent with completed appointments.

	White Race	People of color	p-value
Overall (days)	66.30%	60.50%	0.008
Before Pandemic	49.40%		
After Pandemic	79.10%		<0.001
Before Pandemic		51.90%	
After Pandemic		64.10%	<0.001

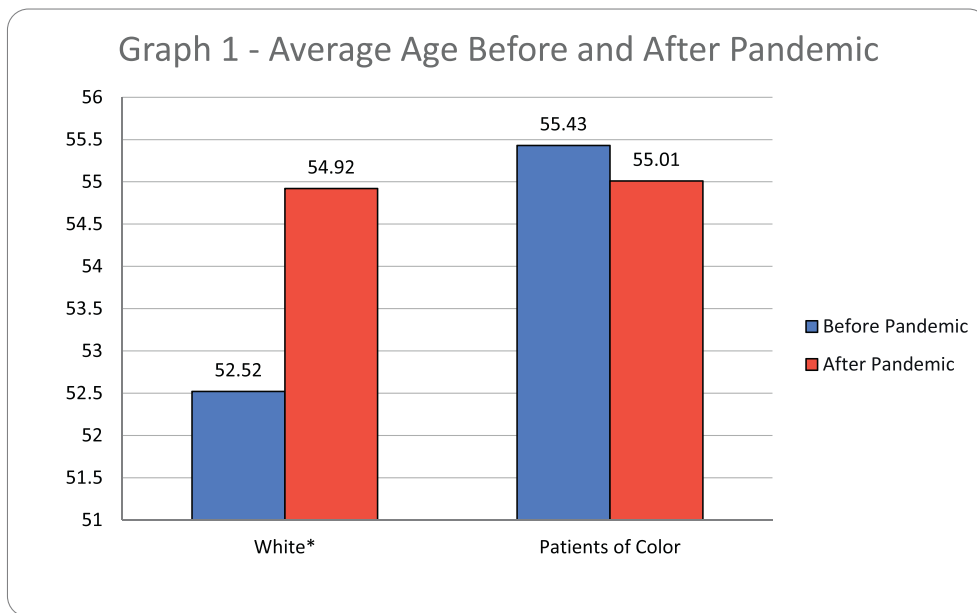


Fig. 1. Average age before and after pandemic

communities in the U.S., the COVID-19 pandemic has aggravated inequalities in healthcare equity for these same communities¹¹. The underlying systemic factors that result in disparities must be recognized and addressed by the healthcare community as a whole. Emerging studies continue to document unsettling differences in health, disease severity, quality of life, and quality of medical care delivered based on the patient's gender, race, ethnicity, and social stratification⁷.

Nationwide, COVID-19 has disproportionately impacted racial and ethnic minorities and the working-class population, accentuating the existing health inequalities in our country¹.

People of color are more likely to be diagnosed at a younger age with medical conditions potentially leading to chronic pain: osteoarthritis, diabetes, and hypertension. The higher percentage of manual labor jobs in people of color makes them more prone to knee trauma and osteoarthritis⁷. Individuals who

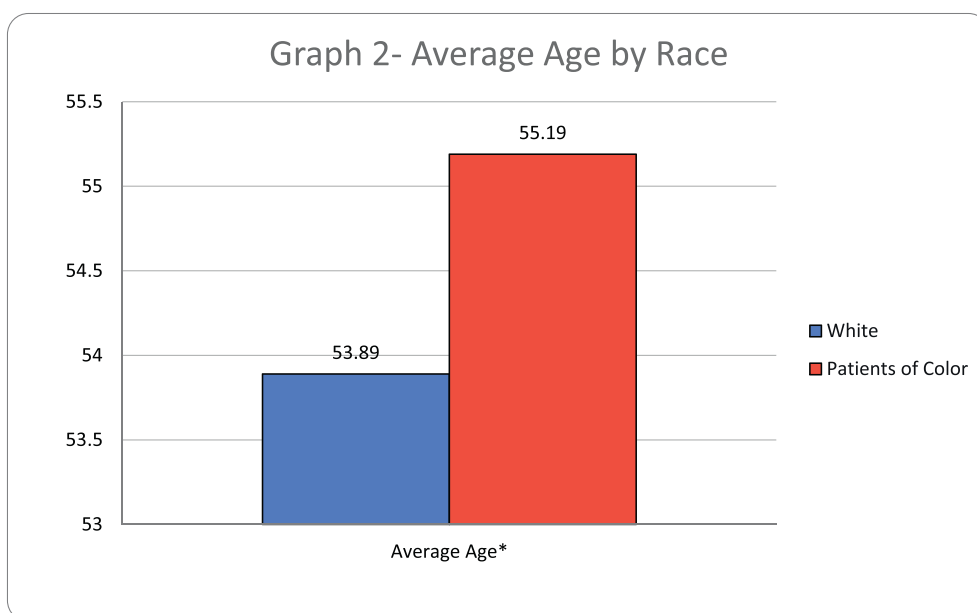


Fig. 2. Average age by race

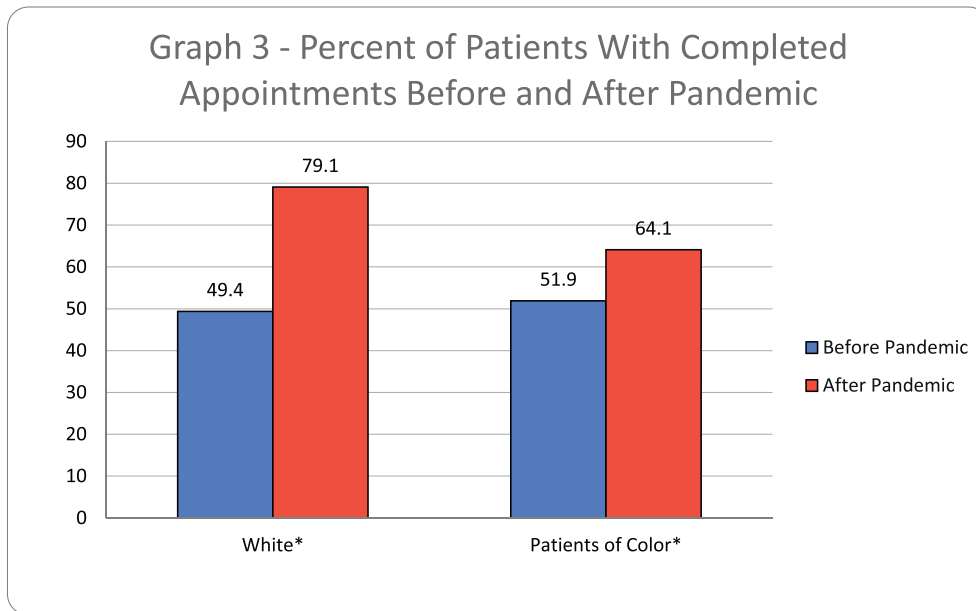


Fig. 3. Percent of patients with completed appointments before and after pandemic

have limited English proficiency are less likely to comprehend or have access to public health information that is distributed throughout their communities¹². These medical conditions, make these group more susceptible to COVID infection¹³.

Another factor putting POC at more risk for COVID infection is lower access to high-quality education that can lead to lower rates of college attendance. This can lead to fewer job opportunities and lower-wage jobs such as those in healthcare

facilities, public transportation, grocery stores, or factories, which are considered essential work. These types of occupations may lead to higher exposures to COVID-19 and often do not come with paid time off or the ability to work remotely that can be associated with higher-paying jobs¹⁴.

Furthermore, individuals in these occupations are less likely to have health insurance and/or to live in close proximity to testing centers. All of these systemic matters can have a significant impact on the

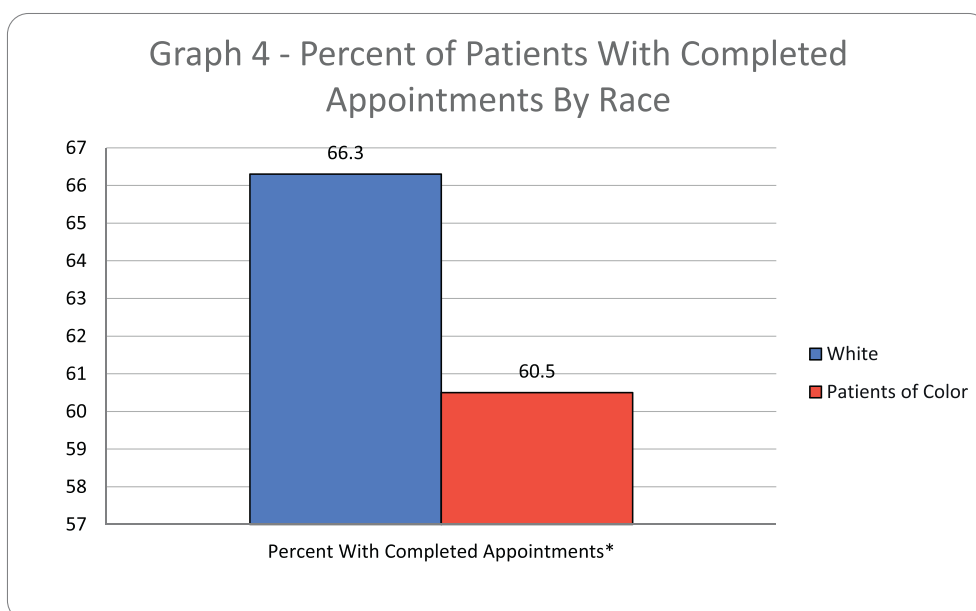


Fig. 4. Percent of patients with completed appointments by race

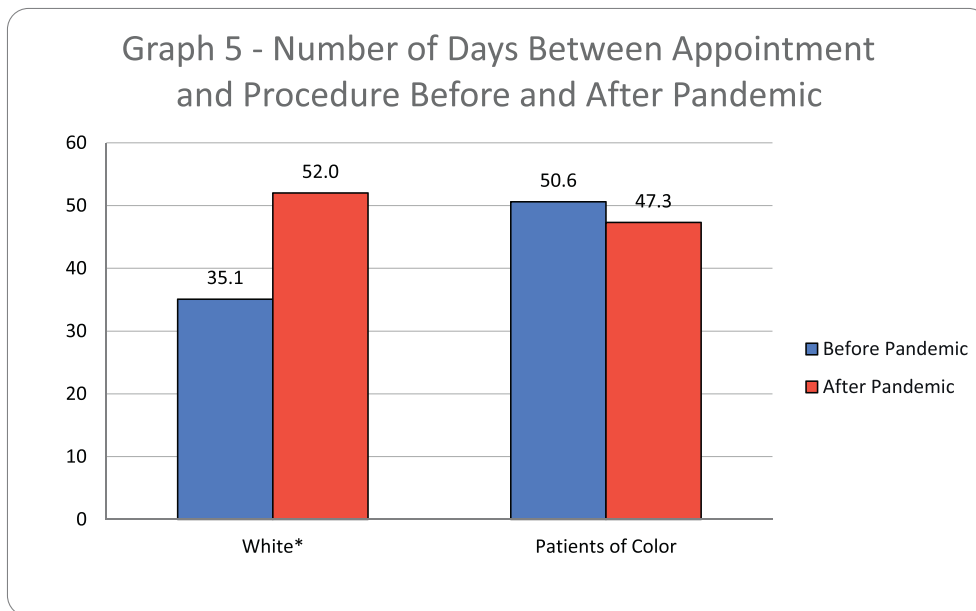


Fig. 5. Number of days between appointment and procedure before and after pandemic

disproportionate infection rate in these populations, and higher rate of comorbidities such as diabetes, hypertension, and obesity. This could correlate with the increased morbidity and mortality we are seeing of COVID-19 in communities of color, especially when these comorbidities coexist¹⁴.

There are other aspects that deserve attention. Previous studies have shown that poor and uninsured African Americans were less likely to pursue emergency room care even when in pain⁷. Lower healthcare utilization rates among African

Americans may demonstrate the emotional and physical reliance some may have on informal institutions, such as churches, for their mental and physical health needs¹⁵.

Also, for the poorest Americans, Medicaid provides a safety-net which grants access to medical care. However, Medicaid often limits the healthcare choices and services available to the patient¹⁶.

Another contributing factor might be the co-payments. In the study done by Green et al., health insurance and prescription coverage were evenly

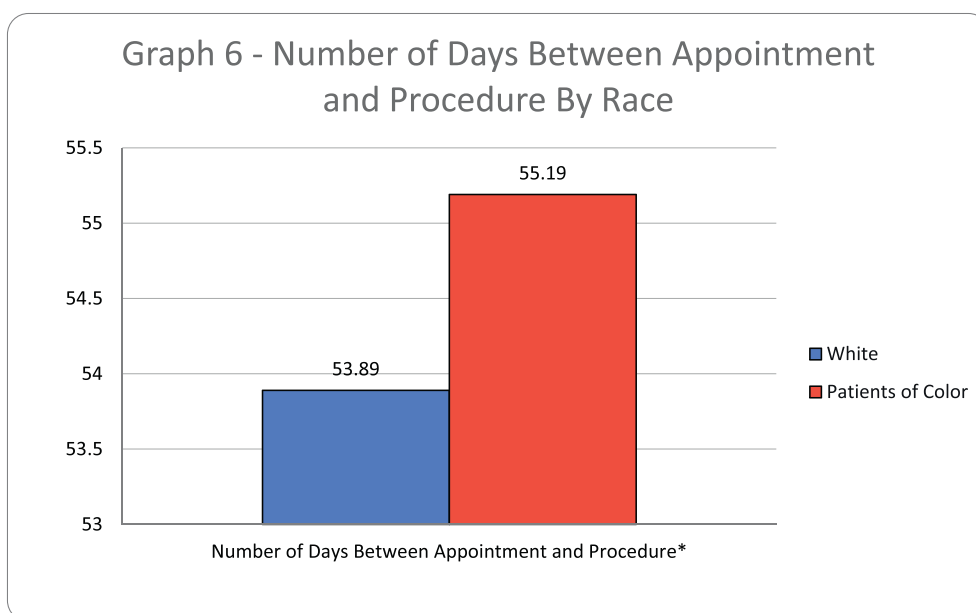


Fig. 6. Number of days between appointment and procedure by race.

distributed among POC and from WR. However, POC were less likely to afford medical care and experienced more difficulty paying for healthcare, suggesting that copays may constitute a major financial barrier to healthcare among POC⁷.

In our study, patients of POC received care at an older age (53.89 years for WR and 55.19 for POC, $P: 0.041$). COVID increased the average age of WR being treated in the pain clinic by 2.5 years, while it didn't affect POC ($P: 0.016$). The reason for that might be that younger WR were more hesitant to put themselves at the risk of getting exposed in a public healthcare facility. Our analysis showed POC on average were referred to the pain clinic at an age 1.3 older than WR before the pandemic. COVID pandemic eliminated this difference.

WR were also more likely to have completed their visits (WR 66.3%, POC 60.5%, $P\text{-Value}: 0.008$). Canceled appointments, left without being seen, and no shows could be attributed to an array of socio-economic factors affecting the POC more than WR including limited access to transportation, child care, and communication services.

This study didn't reveal any significant difference between the 2 groups in regards to the gap between the time of the initial consult and procedure. COVID also didn't demonstrate any effects on this variable. This might be partially affected by the socio-economic level and type of access to healthcare by the WR that usually are seen at the inner-city safety-net hospital.

Previous studies demonstrated targeted implementation of community hospital-sponsored group practices and support systems in lower income and minority communities can improve patient opportunities for appropriate access to primary care services¹⁷. Boston Medical Center has implemented many of these systems to provide equal opportunities to receive affordable, culture oriented health care including promoting culture of Diversity, Equity, and Inclusion at BMC, developing "The BMCHS Culture Code", and "The Glossary for Culture Transformation", JP Morgan Chase/BOS Collaborative, Pharmacy Department All-In Initiative, Equitable and Inclusive Care initiative and many Community Connection including big Sister Association of Boston, Boston Area Health Education Center (BAHEC), Boston Collegiate Charter High School, Madison Park Development Corporation, Dudley Street Neighborhood Initiative, Action for Equity, Jewish Vocational Services (JVS) and many more. The list of all hospital-sponsored programs and other activities towards supporting the minorities and people of color can be found on their

website at <https://www.bmc.org/about-bmc/diversity-equity-and-inclusion>.

4.1. Limitations

One of the limitations of this study was that even though our variables were objective in nature but served as a proxy measurement of equity in health care delivery. Many aspects of disparities are subjective and not possible to investigate via retrospective charts studies. How the people of color felt they had been treated or spoken to, their comprehension of the services rendered compared to patients from white race any many other aspects require a prospective study to collect data via questionnaires.

When designing the study, we were planning to measure the gap between the time PCPs or other referring providers decide to refer the patients to the pain clinic and the time the first visit in the clinic happen. Unfortunately that proved to be difficult to assess, due to lack of access to referring physician's medical records that needed separate IRB approvals from multiple outside health systems.

5. Conclusions

Race based barriers to healthcare access in our society exist and need to be identified and eliminated to improve healthcare outcomes in the POC. Mistrust in the medical community by people of color is rooted inextricably in the history of mistreatment of these communities¹⁴. Despite that COVID-19 disproportionately affecting black Americans, when physicians described COVID-19's manifestations and presented images of dermatologic effects of COVID-19, dark skin has not been included as a influencing factor⁶. We need to see our patients in the context of their socio-economic, race, and gender identities while providing healthcare services.

Our study showed some disparities between the WR and POC that were evident even before the COVID-19 pandemic: older age of the POC referred to the pain clinic, the lower percentage of the patients being POC than the general population, and the larger number of POC unable to complete their treatment plans compared to WR due to cancellations, leaving without being seen, and no shows.

COVID pandemic closed the age gap of the patients referred to the pain clinic, between the two groups. However, we didn't notice any change in other criteria tracked in our patient population. The disparities continued to be the same as before the

COVID-19 pandemic placed strain on healthcare systems.

Although there are many disparities evident that root in the society itself, we noticed that on many instances pain management services were offered to WR and POC equally (similar time gap between appointments and procedures, no gender differences) or in some aspects almost equally (average age) at our institution's pain clinic. COVID-19 also didn't show to have any effects on that. These causes for these favorable outcomes are multifactorial and thus difficult to pinpoint.

We suggest that one of the biggest contributors to equality of care offered to our patients is the multiracial administrative staff at the pain clinic mimicking our patient population and hospital-sponsored support systems and policies that promote equal access to care. Our staff during the pandemic comprised of three POC and one person of WR all with deep roots in the communities we serve. We have observed how well they communicate with the patients with an understanding of their problems and the root cause of their issues brought on by race and socio-economic status. Boston Medical Center policies and resources have been developed to support diversity, equity, inclusion in healthcare delivery. Services such as Immigrant & Refugee Health Center, extensive social worker support offered by the hospital, and having long-term relationships with many diverse community-based service organizations and professional associations, were major contributing factors to what we observed in our study (¹⁸, <https://www.bmc.org/about-bmc/diversity-equity-and-inclusion>).

Racial disparities in the perception, evaluation and treatment of pain have been abundantly documented. Multiple factors can be involved, including the willingness of the primary provider to escalate care, the insurance types and coverages, and the societal barriers for patients to complete the pain clinic visit. Although many aspects can't be changed at the healthcare provider level, other areas could be improved. Educating the primary providers about the disparities in referrals could reduce potential bias. The clinic workflows could be designed to help and accommodate patients with difficult social circumstances. Case managers and social workers could get involved in providing support and resources for transportation and child care during the visits. Community outreach events by healthcare providers could further facilitate the development of trust and inclusivity to healthcare providers. We can also take this opportunity to identify patients who

have fell through the cracks in the healthcare system and help them establish adequate primary care follow-up. Programs to help with special barriers such as language barriers, cultural believes and financial aid can further this cause. We believe further research is needed to elucidate effective interventions further reducing disparities in delivering effective and racially equal access to pain management care (see [Figs. 1–6](#)).

Funding

The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

Availability of Data and Material

The data that support the findings of this study are available and kept secure at the hospital's firewalled server.

Authors' Contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Mohammad Ghorbanhoseini, MD, and Akhil Venkat Uppalapati, BA. The first draft of the manuscript was written by Mohammad Ghorbanhoseini, MD and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Ethics Approval

Approval by the Institutional Review Board was granted. The requirement for individual consent for the study was waived by the IRB of Boston University School of Medicine.

Consent to Participate

The requirement to consent to participation was waived by the IRB of Boston University School of Medicine.

Consent for Publication

The requirement to consent to publication was waived by the IRB of Boston University School of Medicine.

Conflict of interest

The authors have no relevant financial or non-financial interests to disclose.

References

1. Chang BA. COVID-19: The Great Divider. *ASA Monitor*. 2021; 85:39. <https://doi.org/10.1097/01.ASM.0000758388.79151.e62>.
2. Mamelund SE, Dimka J. Not the great equalizers: Covid-19, 1918–20 influenza, and the need for a paradigm shift in pandemic preparedness. *Popul Stud*. 2021;75(suppl 1):179–199. <https://doi.org/10.1080/00324728.2021.1959630>.
3. Johnson SB, Butcher F. Doctors during the COVID-19 pandemic: what are their duties and what is owed to them? *J Med Ethics*. 2021;47(1):12–15. <https://doi.org/10.1136/medethics-2020-106266>.
4. Dueñas M, Ojeda B, Salazar A, Mico JA, Failde I. A review of chronic pain impact on patients, their social environment and the health care system. *J Pain Res*. 2016;9:457–467. <https://doi.org/10.2147/JPR.S105892>.
5. Mein SA. COVID-19 and Health Disparities: the Reality of "the Great Equalizer". *J Gen Intern Med*. 2020;35(8):2439–2440. <https://doi.org/10.1007/s11606-020-05880-5>.
6. Evans MK, Rosenbaum L, Malina D, Morrissey S, Rubin EJ. Diagnosing and Treating Systemic Racism. *N Engl J Med*. 2020; 383(3):274–276. <https://doi.org/10.1056/NEJMe2021693>.
7. Green CR, Baker TA, Ndao-Brumblay SK. Patient attitudes regarding healthcare utilization and referral: a descriptive comparison in African- and Caucasian Americans with chronic pain. *J Natl Med Assoc*. 2004;96(1):31–42.
8. Turk DC. Clinical effectiveness and cost-effectiveness of treatments for patients with chronic pain. *Clin J Pain*. 2002;18(6): 355–365. <https://doi.org/10.1097/00002508-200211000-00003>.
9. Bonham VL. Race, ethnicity, and pain treatment: striving to understand the causes and solutions to the disparities in pain treatment. *J Law Med Ethics*. 2001;29(1):52–68. <https://doi.org/10.1111/j.1748-720x.2001.tb00039.x>.
10. Anderson KO, Green CR, Payne R. Racial and ethnic disparities in pain: causes and consequences of unequal care. *J Pain*. 2009;10(12):1187–1204. <https://doi.org/10.1016/j.jpain.2009.10.002>.
11. Andraska EA, Alabi O, Dorsey C, et al. Health care disparities during the COVID-19 pandemic. *Semin Vasc Surg*. 2021;34(3): 82–88. <https://doi.org/10.1053/j.semvascsurg.2021.08.002>.
12. Witzig R. The medicalization of race: scientific legitimization of a flawed social construct. *Ann Intern Med*. 1996;125(8):675–679. <https://doi.org/10.7326/0003-4819-125-8-199610150-00008>.
13. Kabarriti R, Brodin NP, Maron MI, et al. Association of Race and Ethnicity with Comorbidities and Survival Among Patients With COVID-19 at an Urban Medical Center in New York. *JAMA Netw Open*. 2020;3(9), e2019795. <https://doi.org/10.1001/jamanetworkopen.2020.19795>. Published 2020 Sep 1.
14. Nichols KR, Ghebremichael S, Taylor NL. The Unequal Burden of COVID-19 on Minority Communities. *ASA Monitor*. 2021 Jul;85(7), 27-27.
15. Walls CT, Zarit SH. Informal support from black churches and the well-being of elderly blacks. *Gerontol*. 1991;31(4): 490–495. <https://doi.org/10.1093/geront/31.4.490>.
16. Hurley RE, Somers SA. Medicaid and managed care: a lasting relationship? *Health Aff (Millwood)*. 2003;22(1):77–88. <https://doi.org/10.1377/hlthaff.22.1.77>.
17. Aday LA, Andersen R, Loevy SS, Kremer B. Hospital-sponsored primary care: II. Impact on patient access. *Am J Publ Health*. 1984; 74(8):792–798. <https://doi.org/10.2105/ajph.74.8.792>.
18. Williams DR, Rucker TD. Understanding and addressing racial disparities in health care. *Health Care Financ Rev*. 2000; 21(4):75–90.