Patient Perceptions of their COVID-19 Inpatient Hospital Experience: a Survey Exploring Inequities in Healthcare Delivery

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Received: 27 July 2022 / Revised: 14 October 2022 / Accepted: 7 November 2022 / Published online: 22 November 2022
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Abstract

Background  Compared with White patients, Black and Latinx patients have higher infection, hospitalization, and mortality rates from COVID-19; yet, little is known about their perspective before, during, and after a COVID-19 hospitalization. The objective of this study conducted in White, Black, and Latinx patients was to assess perceptions of their COVID-19–related hospitalization from onset of symptoms through the post-discharge period to identify disparities in their perceived care.

Methods  A cross-sectional observational study using an online survey from May 19 to June 23, 2021, was conducted by The Harris Poll in 200 White, 200 Black, and 201 Latinx patients hospitalized for COVID-19 in the US. Main measures obtained included baseline demographic variables, socioeconomic status, and social determinants of health. Survey questions were specific to key aspects of the patient experience before, during, and after a COVID-19–related hospitalization.

Results  Compared with White patients, Latinx and Black patients faced unique challenges in their healthcare journey including higher likelihood of delaying their hospitalization (10% Black vs. 4% White patients, respectively, $P = 0.025$), lower perceived satisfaction with care (82% Latinx vs 91% White patients, $P = 0.002$), and lower trust in providers following their hospitalization (85% White vs. 65% Latinx [P = 0.027] and 73% Black [P = 0.050] patients).

Conclusions  Patient perceptions of their COVID-19 hospitalization experience revealed disparities in perceived quality of care among minority groups. These findings offer insights that health inequities still exist, and strategies need to be taken to make health care delivery more equitable.

Keywords  COVID-19 hospitalization · Healthcare inequity · Patient perception

Introduction

The COVID-19 pandemic has affected healthcare on a global scale and has accentuated health inequities that have always existed in the US healthcare system [1–3]. This pandemic has exposed the disproportionate equity gap in outcomes for marginalized communities, specifically the Black and Latinx communities, as shown by the disparate morbidity and mortality from COVID-19 in individuals from these communities compared with the majority White population [1, 2, 4–6]. Higher rates of chronic diseases, which are established risk factors for SARS-CoV-2 infection and mortality, including diabetes, asthma, and heart disease have been well documented in minority groups [1, 4, 5, 7]. Furthermore, adverse socioeconomic factors and social determinants of health (SDoH) disproportionately affect minorities, leading to reduced access to healthcare and increased likelihood of working jobs that inhibit their ability to comply with social distancing
recommendations, thus directly or indirectly increasing the risk of COVID-19 susceptibility and mortality [1, 2, 4, 5]. During the COVID-19 pandemic, drivers influencing clinical outcome disparities were linked to factors that increased the risk of susceptibility and mortality, particularly affecting the Black and Latinx patient populations [5, 6, 8].

Unlike morbidity and mortality-related outcomes, there is a paucity of evidence on patient-reported experiences during a COVID-19 hospitalization. It is imperative to understand the patient perspective, as it can provide unique insight on the quality of care received and how experiences may differ across racial and ethnic groups [9–11]. In 2021, a recent survey was administered to patients in order to gain insights into a patients’ understanding and concerns related to COVID-19 and screening for mental and physical health [9]. The survey results from the study provided insight into some of the mitigation strategies and approaches that could be adopted for patients with mental health concerns about their risk of COVID-19 [9]. Quality of care may be associated with health outcomes; patients who report poor experiences with health systems are at higher risk of nonadherence to treatment recommendations and are more likely to postpone their care, compared with patients who report better experiences [11–14]. Furthermore, the patient-centric perspective is largely rooted in human interaction with medical teams and not typically addressed in studies that rely solely on electronic medical records and clinical outcomes [11, 15, 16]. Disparities in quality of care have the potential to exacerbate health disparities in minorities, and some studies have uncovered race-based unconscious bias in patient-provider interactions [17–19]. Qualifying patient experiences through surveys or other tools can enhance our ability to reduce the health equity gap by establishing a more complete evidence framework to understand the potential causal pathways contributing to these health disparities in the US healthcare system.

We conducted a survey of US patients to assess perceptions of their COVID-19–related hospitalization, from their onset of symptoms, through hospitalization and the post-discharge period, to identify if disparities between perceived quality of care exist in Black and Latinx patient populations compared with White patient populations. Our findings may offer a unique perspective around patient perceptions of their care and outcomes and may readily provide information and insights into the quality of their care, which may shed light on how experiences may differ across racial and ethnic groups.

**Methods**

**Study Sample and Data Collection**

This survey was conducted online by The Harris Poll (Harris Poll, New York, NY; https://theharrispoll.com), an independent market research and analytics company, in the USA from May 19 to June 23, 2021, collecting 601 responses from 200 White, 200 Black, and 201 Latinx patients hospitalized for COVID-19. The Harris Poll obtained the convenience sample through two independent panel sources, the “General Public Sample Panel Providers” and the “Physician Sample Panel Providers” (see Supplementary Fig. 1, Recruitment Flowchart). Respondents from the “General Public Sample” were recruited through partners’ websites, targeted emails sent by online partners, and telephone recruitment of target populations from the US population. The “Physician Sample Provider Panel” targeted respondents through a network of physicians that performed pre-screening, recruitment, and distribution of the research engagement. Respondents were responsible for being truthful and accurate in their responses. Prior to entering the survey, participants were asked several questions, which were used to determine if they qualify for the study. Survey respondents were selected from both panels who agreed to participate in the survey and met the inclusion criteria, i.e., current residents of the USA, aged 18 years or older, had been hospitalized at any time for COVID-19 and had experienced COVID-19 symptoms. Respondents received honoraria of $10–20 for participating in the research, depending on the sampling provider. Demographic information, including gender, age, and race, was obtained from all respondents. Questions included in the survey assessed perceptions and experiences with COVID-19 hospitalization, satisfaction with care delivered, and post-hospitalization experiences.

**Statistical Analysis**

All patient information was de-identified prior to data analysis. Patients were weighted to accurately reflect the composition of White, Black, and Latinx patients in the US population. As recommended in the survey statistics methodology literature, we applied the raking ratio estimation (2-step approach) to ensure that the marginal totals of the sample weights are reflective of the national US population to improve sample representativeness and reduce the risk of noncoverage and nonresponse bias [20, 21]. In Step 1, the initial total opt-in online sample of all US adults aged 18+ was weighted to population benchmarks from the March 2020 Current Population Survey. In Step 2, the total combined sample of COVID-19 patients from both sample sources was weighted using the estimated demographic distributions of the initial weighted opt-in online subset sample of hospitalized COVID-19 patients. The respondent level weights from Step 2 were used as the final weights. The variables included in the weighting algorithm for both steps were education, age by gender, race/ethnicity, census region, household size, and marital status. A propensity score variable was also included to adjust for respondents’ propensity to be online. Raked weights were estimated using Random Iterative Method weighting [22].

Percentages were calculated using the weighted base, defined as the weighted number of total respondents. A chi-square statistical test was performed in excel on the baseline
characteristics, data related to their COVID-19 hospital journey (admittance to the hospital, satisfaction with healthcare received during the stay, and post-hospitalization experience) between Latinx, Black, and White survey data. Differences in patient perceptions across race/ethnicity were assessed using the chi-square test to show overall significance among the patient groups and comparison between groups.

Results

Patient Characteristics: Baseline Demographics and Socioeconomic Status

The majority of patients were under the age of 50 years (83%, \( n=499 \)) and male (67.9%, \( n=408 \)). Most patients were from the South (46.3%, \( n=278 \)), with a similar proportion from the Northeast (17%, \( n=102 \)), Midwest (16.6%, \( n=100 \)), and West (20.1%, \( n=121 \)). Overall, patients had above average education and income with 51% (\( n=309 \)) having attended a 4-year college or higher, and 63% (\( n=380 \)) having a household income of at least $75,000 per year. Finally, patients were more likely to be employed (84%, \( n=507 \)) and live in a household with four or more individuals (54%, \( n=324 \)) (Table 1).

Patient Characteristics: Baseline SDoH and Access/Coverage

Differences in SDoH were noted for White, Black, and Latinx patients. In general, Black patients were less likely to have access to health insurance compared with White patients (\( P=0.009 \)). Black and Latinx patients were more likely to be employed as frontline healthcare workers, with Latinx patients being two times more likely than White patients (28% vs 14%, respectively; \( P<0.001 \)), and Latinx patients were more likely to serve as essential workers (non-healthcare) during the pandemic (51% vs 38%, respectively; \( P=0.003 \)) compared with White patients. There were no significant differences in rates of chronic medical conditions between the groups (Table 2).

Journey to COVID-19 Hospitalization

Once COVID-19-associated symptoms began, 72% of patients went to the hospital within 7 days, with the majority (46%) between days 3 and 6. Black patients were 2.5 times more likely to have waited for two or more weeks to go to the hospital compared with White patients (10% vs 4%, respectively, \( P=0.025 \)). Black patients were also two times more likely than White patients to indicate employment (inability to take time off) (21% vs. 10%, respectively, \( P<0.001 \)) and healthcare cost (18% vs. 8%, respectively, \( P=0.005 \)) as drivers in their decision-making prior to hospitalization (Fig. 1). From the survey, a respondent stated, “I was worried to go because I was laid off and had no health insurance so there was not too much information, I know people said everything was covered, it was really confusing.” — Black Patient.

Satisfaction with Healthcare

During their COVID-19 hospitalization, 86% of all patients indicated satisfaction with the level of care they received. Among the 14% that reported lower satisfaction with care, 37% mentioned long wait times, 29% perceived some sense of discrimination, and 27% mentioned frustration with limited healthcare workers (e.g., doctors, nurses, and supporting staff). From the survey, a respondent stated, “I was worried because Covid seemed to kill more blacks than whites, so I was worried. It was just a scary time when I was in the hospital and my kids or husband could not even come to visit me. I was on a ventilator, and I was scared where it was going.” — Black Patient.

Compared with White patients, satisfaction was lower among Latinx (91% vs. 82%, respectively [\( P=0.010 \)]) and non-significantly lower among Black patients (91% vs. 86%). Compared with White patients, Black and Latinx patients were significantly less likely to describe their healthcare team as “friendly” (61% of White vs. 58% of Black and 44% of Latinx patients [\( P<0.001 \)]). From the survey, a respondent stated, “It was stressful to have to wait, as hospitals had been crowded due to the influx of people who believed they had COVID and extreme symptoms.” — Hispanic Patient. Latinx patients were two times more likely than White patients to describe the healthcare team as “aggressive” (10% vs. 4%, respectively, \( P=0.003 \)), while Black patients were five times more likely than White patients to describe their care team as “careless” (11% vs. 2%, respectively, \( P<0.001 \)).

Black patients were significantly more likely than White patients to list issues with bedside manner, such as lack of personal attention/care and sympathy/compassion from healthcare staff (20% vs. 8%, respectively, \( P<0.001 \)) (Fig. 1). From the survey, a respondent stated, “Very little personal care, no one helped you with bathing, eating, getting out of bed etc.” — Black Patient.

Post-Hospitalization Perceptions and Communication

Compared with White patients, Latinx and Black patients were less likely to say they trusted doctors and nurses since their admission (85% vs. 65% and 73%, respectively [\( P=0.027 \)]). After being discharged from the hospital for COVID-19, 89% of White patients would give themselves an “A” or “B” rating for their overall knowledge of COVID-19 compared with 77% of Black and 79% of Latinx patients; (\( P=0.004 \)) (Fig. 1).
Discussion

This is the first national survey that examines the differences in patient perceptions across racial and ethnic groups in the quality of care received during a COVID-19 hospitalization. Throughout the patient journey, we found key trends that highlight the unique challenges before, during, and after a COVID-19 hospitalization in Black and Latinx patients compared with White patients.

Leading up to their first hospitalization, after initial symptom onset, Black patients were more likely than White patients to wait for two or more weeks before getting to a hospital, potentially driven by Black patients having lower rates of insurance coverage and more employer restrictions on time off. This is consistent with the findings by Banks and Dracup (2007) [23], a survey study that identified Black patients delay seeking medical care for cardiac events, and...
Table 2  Baseline SDoH

| Variable                                           | Total  (N=601) | White  (n=200, n=255a (n)) | Black  (n=200, n=108a (n)) | Latinx (n=201, n=238a (n)) | P valueb |
|---------------------------------------------------|----------------|----------------------------|-----------------------------|----------------------------|----------|
| Healthcare access and living conditions           |                |                            |                             |                             |          |
| Have health insurance                             | 87% (522)      | 92% (234)                  | 82% (89)a                   | 84% (200)                  | 0.011    |
| Can get to a provider’s office in 60 min          | 77% (462)      | 82% (210)                  | 85% (79)                    | 70% (167)a                 | 0.005    |
| Family unable to properly quarantine in separate | 25% (150)      | 18% (45)                   | 29% (30)a                   | 31% (73)a                  | 0.002    |
| room in HH                                        |                |                            |                             |                             |          |
| Baseline health                                   |                |                            |                             |                             |          |
| Have a chronic condition currently managing with  | 41% (246)      | 38% (97)                   | 44% (47)                    | 43% (102)                  | 0.462    |
| Rx or treatment                                   |                |                            |                             |                             |          |
| Working conditions                                |                |                            |                             |                             |          |
| Frontline healthcare worker and have been working | 22% (131)      | 14% (35)                   | 26% (27)a                   | 28% (68)a                  | <0.001   |
| during the pandemic                               |                |                            |                             |                             |          |
| Essential worker (non-healthcare) and have been   | 45% (268)      | 38% (96)                   | 48% (52)                    | 51% (121)a                 | 0.010    |
| working during the pandemic                       |                |                            |                             |                             |          |

HH household, Rx prescription, SDoH social determinants of health

a Weighted base to adjust for propensity to be online and US census population benchmarks
b The chi-squared test was used to test for differences in observed and expected values among groups (White, Black, and Latinx) for each data set. Statistical significance was evaluated at a threshold of α = 0.05
* Data was found to be statistically significant compared with White patients (P<0.05)

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**Fig. 1** Patient experiences before, during, and after a hospitalization. This figure illustrates the unique challenges faced by Black and Latinx patients compared with White patients throughout the patient journey. For satisfaction with healthcare delivered, the issues listed with bedside manner from healthcare staff included lack of personal attention, care, and sympathy/compassion
later confirmed by a separate study [24], which demonstrated increased prevalence of reported urgent or emergency care avoidance among Black and Latinx adults compared with White adults in a COVID-19–associated mortality study, both of which support the account for the longer delay times observed in Black patients compared with White patients [23–25], which may account for the longer delay times observed in Black patients compared with White patients. Our data also demonstrated that Black patients were two times more likely than White patients to indicate the costs of healthcare factored in their decision-making, prior to hospitalization. Other studies have suggested that delaying medical care has been strongly associated with coverage under a high-deductible health plan (in which a person must make an out-of-pocket payment) [26].

Our results revealed overall lower satisfaction in healthcare delivery among Black and Latinx patients compared with White patients. Latinx patients, in comparison with White patients, were less likely to describe their care teams as “friendly.” While we do not have baseline language competency data available, other studies suggest that Spanish-speaking patients reported lower satisfaction ratings with healthcare when compared with other racial and ethnic groups [27–29]. It has been suggested that language barriers are the primary cause of lower healthcare satisfaction in Latinx, Spanish-speaking patients compared with English-speaking patients [27–29]. Among Latinx patients, Spanish-speaking preference predicted the lowest satisfaction, and patients with English-speaking preference had higher satisfaction [29, 30]. A recent study confirmed that satisfaction with physician communication was associated with the ability to speak the language in Spanish-speaking patients [31]. However, O’Brien and Shea (2009) found that within linguistically competent settings with bilingual staff, multivariate analysis indicated that language preference among Latinx patients was not significantly associated with healthcare satisfaction [32].

While Black patients were more likely than White patients to list something missing from the care they received, it was noteworthy that Black patients were five times more likely to describe the healthcare team that looked after them as “careless.” Previous studies have reported that because of historical events and prior perceptions of racial discrimination, Black patients may have lower levels of trust in the healthcare system [33–35]. Outside of the context of COVID-19, recent evidence is mixed on a meaningful gap in patient experience between Black and White patients. A study by Figueroa et al. reported that differences are smaller among those with at least some college experiences [11], implying that education is a possible confounder behind low satisfaction among Black patients. In this survey, a significantly smaller proportion of Black patients were educated beyond a 4-year college degree compared with White patients, thus suggesting that patient satisfaction might be lower in Black patients who attain lower levels of education.

Post hospitalization, Latinx and Black patients appear to be less trusting than White patients in their healthcare providers [36, 37]. In the context of the COVID-19 pandemic, this is especially important as mistrust of a healthcare system is associated with both poorer health and underutilization of healthcare resources including taking medical advice, filling prescriptions, and keeping follow-up appointments [38, 39]. In fact, a recent study conducted through semi-structured phone interviews in the state of Oregon found that 45% of Latinx patients expressed hesitancy around COVID-19 vaccination based on mistrust, including the fear of being used as “guinea pigs” [37]. Part of this mistrust may also be associated with a lower knowledge of COVID-19, as our results suggest Black and Latinx patients were more likely to report lower knowledge of COVID-19 compared with White patients.

This study comes with three important limitations that often accompany quantitative survey research. First, our analysis is descriptive and does not control for confounders. While the population was adjusted to capture the socioeconomic imbalance that exists among the demographic groups, we found differences in important SDoH, such as baseline income and education. However, in describing the major trends, we have allowed for nuanced interpretation of key findings by describing suspected effect modifiers. Second, sample bias may be an important consideration as our survey only included patients who agreed to participate and, thus, may not be nationally representative for all groups. Third, we cannot exclude the possibility of responder bias where given the recent polarized political climate, survey responders of a minority demographic may have been influenced to respond differently to categorical survey responses. This is especially important when considering questions on “general discrimination,” without specifying whether it is race, gender, or age based. However, our findings demonstrate trends consistent with the previous research.

Despite these limitations, this study leverages the patient voice that is often lacking in healthcare delivery and research, with findings revealing key areas in the patient journey that may fuel gaps in health equity. Incorporating patient perspectives in future research is imperative to disentangle the causal relationships that may exist between the SDoH and health outcomes. This shift from focusing solely on patients’ clinical outcomes to focusing on patients altogether by engaging them in the delivery of their care has the potential to drive quality care, improved health outcomes, and reduce inequities [40]. For example, our findings support recommendations for public health programs that improve access to healthcare and education outreach, specifically for vulnerable minority groups. Our findings also emphasize the potential benefits of having bilingual staff for Latinx
patients and suggest an opportunity for providers to tailor communication styles specifically to at-risk minority groups. While the COVID-19 pandemic placed extreme stress on US healthcare providers as they dealt with staffing shortages and surge capacity, our findings suggest these communication barriers may contribute to distrust among certain minority groups. Additionally, educational outreach programs at discharge and following a hospitalization are crucial for vulnerable populations to have confidence in their understanding of their disease processes and ensure appropriate follow-up.

Ultimately, the results from our study highlight some key gaps from the patient perspective that may contribute to health inequities. These results reveal disparities in perceived quality of care resulting from barriers to healthcare for minority individuals compared with White patients. A poor experience can lead to distrust and non-adherence to treatment, which can then lead to poor health outcomes. Additional research and studies are needed to explore the core components of an ideal patient experience and its impact on patient health outcomes.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s40615-022-01454-9.

Acknowledgements The authors would like to express their gratitude to the patients who participated in the survey to explore this research on racial disparity during the COVID-19 pandemic. Data acquisitions were managed by The Harris Poll on behalf of Gilead Sciences, and strict process and quality control measures were provided to evaluate the collected data.

Editorial assistance in the preparation of this article was provided by Aparna Sharma of ZS Associates.

Author Contribution TFO, BP, MFC, and CCC were responsible for the conceptualization of the study, collecting data, and financially supporting the research; LG, NF, and MG were responsible for data analysis, creation of tables and figures as well as manuscript development. All named authors meet the ICMJE criteria for authorship of this article and take responsibility for the integrity of the work and have given consent to publish these results.

Funding This study was funded by Gilead Sciences, Inc.

Declarations

Ethics Approval Qualified respondents provided consent to complete the survey. The surveys were non-interventional and were not conducted as a clinical study. All respondents were required to fill out digital consent and invitation/opt-in forms prior to starting the online survey in order to participate; however, due to the nature of the study, ethics approval was not required.

Consent to Participate Participants who qualified to participate in the survey consented to participate prior to starting the survey.

Consent for Publication Not applicable. The survey was conducted by The Harris Poll in accordance with their privacy policy and other privacy regulations. Patients who consented to participate in the survey were informed that their data would be deidentified and utilized for research purposes.

Competing Interests The authors declare no competing interests.

References

1. Okonkwo NE, Agwu UT, Jang M, Barré IA, Page KR, Sullivan PS, et al. COVID-19 and the US response: accelerating health inequities. BMJ Evid Based Med. 2020;26(4):176–9. https://doi.org/10.1136/bmjebm-2020-111426.

2. Rogers TN, Rogers CR, VanSant-Webb E, Gu LY, Yan B, Qeadan F. Racial disparities in COVID-19 mortality among essential workers in the United States. World Med Health Policy. 2020. https://doi.org/10.1002/wmh3.358.

3. Nunez A, Sreeganga SD, Ramprasad A. Access to healthcare during COVID-19. Int J Environ Res Public Health. 2021;18(6):2980. https://doi.org/10.3390/ijerph18062980.

4. Hooper MW, Nápoles AM, Pérez-Stable EJ. COVID-19 and racial/ethnic disparities. JAMA. 2020;323(24):2466–7. https://doi.org/10.1001/jama.2020.8598.

5. Mackey K, Ayers CK, Kondo KK, Saha S, Advani SM, Young S, et al. Racial and ethnic disparities in COVID-19-related infections, hospitalizations, and deaths: a systematic review. Ann Intern Med. 2021;174(3):362–73. https://doi.org/10.7326/m20-6306.

6. Millett GA, Jones AT, Benkeser D, Baral S, Mercer L, Beyrer C, et al. Assessing differential impacts of COVID-19 on black communities. Ann Epidemiol. 2020;47:37–44. https://doi.org/10.1016/j.annepidem.2020.05.003.

7. Aggarwal R, Chiu N, Loccoh EC, Kazi DS, Yeh RW, Wadhera RK. Rural-urban disparities: diabetes, hypertension, heart disease, and stroke mortality among Black and White adults, 1999–2018. J Am Coll Cardiol. 2021;77(11):1480–1. https://doi.org/10.1016/j.jacc.2021.01.032.

8. Mude W, Oguoma VM, Nyanhanda T, Mwanri L, Njue C. Racial disparities in COVID-19 pandemic cases, hospitalisations, and deaths: a systematic review and meta-analysis. J Glob Health. 2021;11:05015. https://doi.org/10.7189/jogh.11.05015.

9. Burn H. Gaining the patient perspective on COVID-19 and how best to respond to it. Br J Gen Pract. 2021;71(703):70. https://doi.org/10.3399/bjp21X714713.

10. Cleary PD. A hospitalization from hell: a patient’s perspective on quality. Ann Intern Med. 2003;138(1):33–9. https://doi.org/10.7326/0003-4819-138-1-200301070-00009.

11. Figueroa JF, Zheng J, Orav EJ, Jha AK. Across US hospitals, Black patients report comparable or better experiences than White patients. Health Aff. 2016;35(8):1391–8. https://doi.org/10.1377/hlaff.2015.1426.

12. Panahi S, Rathi N, Hurley J, Sundrud J, Lucero M, Kamimura A. Patient adherence to healthcare provider recommendations and medication among free clinic patients. J Patient Exp. 2022;9:23743735221077524. https://doi.org/10.1177/23743735221077523.

13. Little P, Everitt H, Williamson I, Warner G, Moore M, Gould C, et al. Observational study of effect of patient centredness and positive approach on outcomes of general practice consultations. BMJ. 2001;323(7318):908–11. https://doi.org/10.1136/bmj.323.7318.908.

14. Ruiz-Moral R, Perula de Torres LA, Jaramillo-Martin I. The effect of patients’ met expectations on consultation outcomes. A study with family medicine residents. J Gen Intern Med. 2007;22(1):86–91. https://doi.org/10.1007/s11606-007-0113-8.

15. Butler JM, Gibson B, Lewis L, Reiber G, Kramer H, Rupper R, et al. Patient-centered care and the electronic health record: exploring functionality and gaps. JAMIA Open. 2020;3(3):360–8. https://doi.org/10.1093/jamiaopen/ooa044.

16. Ratwani R. Electronic health records and improved patient care: opportunities for applied psychology. Curr Dir Psychol Sci. 2017;26(4):359–65. https://doi.org/10.1177/0963721417700691.

17. Sim W, Lim WH, Ng CH, Chin YH, Yao CYL, Cheong CWZ, et al. The perspectives of health professionals and patients on racism in
healthcare: a qualitative systematic review. PLoS ONE. 2021;16(8): e0255936. https://doi.org/10.1371/journal.pone.0255936.

18. Devakumar D, Selvarajah S, Shannon G, Muraya K, Lasoye S, Corona S, et al. Racism, the public health crisis we can no longer ignore. Lancet. 2020;395(10242):e112–3. https://doi.org/10.1016/S0140-6736(20)31371-4.

19. Williams DR, Wyatt R. Racial bias in health care and health: challenges and opportunities. JAMA. 2015;314(6):555–6. https://doi.org/10.1001/jama.2015.9260.

20. American Association for Public Opinion Research. Standard definitions: final dispositions of case codes and outcome rates for surveys. 9th ed2016 (Revised). https://www.aapor.org/aapor_main/media/publications/standard-definitions20169theditionfinal.pdf. Accessed 6 Mar 2022.

21. Deville J-C, Sarndal C-E, Sautory O. Generalized raking procedures in survey sampling. J Am Stat Assoc. 1993;88(423):1013–20. https://doi.org/10.2307/2290793.

22. Kalton G, Flores-Cervantes I. Weighting methods. J Off Stat. 2003;19(2):81–97.

23. Banks AD, Dracup K. Are there gender differences in the reasons why African Americans delay in seeking medical help for symptoms of an acute myocardial infarction? Ethn Dis. 2007;17(2):221–7.

24. Czeisler ME, Marynak K, Clarke KEN, Salah Z, Shakya I, Thierry JM, et al. Delay or avoidance of medical care because of COVID-19-related concerns—United States, June 2020. MMWR Morb Mortal Wkly Rep. 2020;69(36):1250–7. https://doi.org/10.15585/mmwr.mm6936a4.

25. Ogedegbe G, Ravenell J, Adhikari S, Butler M, Cook T, Francois F, et al. Assessment of racial/ethnic disparities in hospitalization and mortality in patients with COVID-19 in New York City. JAMA Netw Open. 2020;3(12): e2026881. https://doi.org/10.1001/jamanetworkopen.2020.26881.

26. National Academies of Sciences E, and Medicine; Health and Medicine Division; Board on Health Care Services; Committee on Health Care Utilization and Adults with Disabilities. Health-care utilization as a proxy in disability determination. In: (US) WDNAP, editor. 2018.

27. Gonzalez D, Kenney GM, McDaniel M, and, O’Brien C. Racial, ethnic, and language concordance between patients and their usual health care providers 2022 [Available from: https://www.urban.org/sites/default/files/2022-03/racial-ethnic-and-language-concordance-between-patients-and-providers.pdf]. Accessed 10 Oct 2022.

28. Lopez L 3rd, Hart LH 3rd, Katz MH. Racial and ethnic health disparities related to COVID-19. JAMA. 2021;325(8):719–20. https://doi.org/10.1001/jama.2020.26443.

29. Morales LS, Cunningham WE, Brown JA, Liu H, Hays RD. Are Latinos less satisfied with communication by health care providers? JGIM. 1999;14(7):409–17.

30. Mosen DM, Carlson MJ, Morales LS, Hanes PP. Satisfaction with provider communication among Spanish-speaking Medicaid enrollees. Ambul Pediatr. 2004;4(6):500–4.

31. Flower KB, Skinner AC, Yin HS, Rothman RL, Sanders LM, Delamater A, et al. Satisfaction with communication in primary care for Spanish-speaking and English-speaking parents. Acad Pediatr. 2017;17(4):416–23. https://doi.org/10.1016/j.acap.2017.01.005.

32. O’Brien M, Shea J. Disparities in patient satisfaction among Hispanics: the role of language preference. J Immigr Minor Health. 2011;13(2):408–12.

33. Armstrong K, Pritt M, Halbert CH, Grande D, Schwartz JS, Liao K, et al. Prior experiences of racial discrimination and racial differences in health care system distrust. Med Care. 2013;51(2):144–50. https://doi.org/10.1097/MLR.0b013e31827310a1.

34. LaVeist TA, Nickerson KJ, Bowie JV. Attitudes about racism, medical mistrust, and satisfaction with care among African American and White cardiac patients. Med Care Res Rev. 2000;57(Suppl 1):146–61. https://doi.org/10.1177/1077558700057001S07.

35. Powell W, Richmond J, Mohottige D, Yen I, Joslyn A, Corbie-Smith G. Medical mistrust, racism, and delays in preventive health screening among African-American men. Behav Med. 2019;45(2):102–17. https://doi.org/10.1080/08964289.2019.1585327.

36. Boulware LE, Cooper LA, Ratner LE, LaVeist TA, Powe NR. Race and trust in the health care system. Public Health Rep. 2003;118(4):358–65. https://doi.org/10.1038/phu.118.4.358.

37. Garcia J, Vargas N, de la Torre C, Magana Alvarez M, Clark JL. Engaging Latino families about COVID-19 vaccines: A qualitative study conducted in Oregon, USA. Health Educ Behav. 2021;48(6):747–57. https://doi.org/10.1177/10901981211045937.

38. LaVeist TA, Isaac LA, Williams KP. Mistrust of health care organizations is associated with underutilization of health services. HSI. 2009;44(6):2093–105.

39. Armstrong K, Rose A, Peters N, Long JA, McMurphy S, Shea JA. Distrust of the health care system and self-reported health in the United States. JGIM. 2006;21(4):292–7.

40. Majid U, Wasis A. Patient-centric culture and implications for patient engagement during the COVID-19 pandemic. PJX. 2020;7(3):5–16. https://doi.org/10.35680/2372-0247.1398.

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