“Treat everyone fair, respect each other, no matter what race, now repeat”: Informatics opportunities for promoting equitable patient-centered clinical interactions for patients from marginalized groups

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Abstract

Background: Implicit bias in healthcare impacts clinicians' behaviors and can lead to health inequities for Black, Indigenous, People of Color (BIPOC) and Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ+) patients. Prior work has developed tools aimed at raising clinician awareness of potential implicit bias and improving interactions with patients, particularly those from marginalized communities. However, there is a gap in understanding what patients consider to be promising strategies to improve their interactions with clinicians and promote patient-centered, equitable care.

Objective: To build upon our previous work identifying dimensions of implicit bias in clinical interactions, this study aims to characterize patient-generated strategies for improving interactions between clinicians and BIPOC and LGBTQ+ patients. By focusing on patients' perspectives, we advance beyond clinician-centered approaches to address implicit bias and promote equitable, patient-centered care.

Methods: We recruited a diverse sample of BIPOC and LGBTQ+ adults (n=25) through institutional networks, social media, and community champions. Sample size was determined by thematic saturation. Semi-structured remote interviews were conducted to gather insights on strategies for enhancing interactions with clinicians. We employed inductive thematic analysis, involving iterative coding and theme development, to identify emergent patient-generated strategies for improving clinical interactions and addressing implicit bias. The analysis continued until consensus was reached among the research team.

Results: Participants generated five strategies for mitigating implicit bias and promoting equitable patient-centered interactions with clinicians: (1) giving feedback to clinicians, (2) having a patient advocate, (3) enhancing clinicians' training, (4) diversifying healthcare workforce, and (5) amplifying positive experiences. These strategies offer novel, patient-centered approaches to addressing implicit bias in healthcare. Participants emphasized the need for anonymous feedback systems, culturally competent patient advocates, and comprehensive bias recognition training for clinicians. They also highlighted the importance of increasing diversity in the healthcare workforce and leveraging positive experiences to model effective patient-clinician interactions. Notably, participants suggested using technology to facilitate real-time communication monitoring and provide digital patient advocacy, offering innovative solutions to longstanding challenges in healthcare equity.

Conclusions: Understanding patient priorities for addressing implicit biases in clinical interactions is vital for developing effective strategies to promote patient-centered care. These findings advance related work by providing patient-generated opportunities to improve clinician-patient relationships, moving beyond clinician-focused interventions. Researchers and healthcare professionals can leverage these insights to design interventions that empower patients and foster equitable relationships between clinicians and individuals from marginalized communities. Future research should focus on co-designing and evaluating tools with patients and clinicians to implement these strategies effectively, with particular attention to overcoming power imbalances and improving communication in clinical settings.

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Keywords: Implicit bias; interview; qualitative research; patient-centered care; nonverbal communication; health disparity, minority and vulnerable populations

Abstract

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Introduction

Implicit bias–based on a patient's race, ethnicity, gender, gender identity, or sexual orientation–shapes clinicians' behavior and can result in subtle differences in medical treatment that negatively impact patient-clinician interactions [1–4]. Bias-driven differences in care quality [4,5], treatment decisions [1,5,6], and patient outcomes [3] can lead to measurable inequities in healthcare [1–3,6]. These biases are well-documented for patients who are Black, Indigenous, and People of Color (BIPOC) [4,6–8] and Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ+) [3–5]. For example, Black patients receive less patient-centered communication, have poorer reproductive outcomes [8], and are prescribed less pain medication [9]. LGBTQ+ patients also face unique vulnerabilities in healthcare, leading many to hide their identities, conceal personal relationships, or delay healthcare [10–12], all of which negatively impact their physical and psychological health [10,13].

Although many efforts to address implicit bias focus on improving communication skills [14–16], clinicians often overestimate their ability to effectively communicate with patients [17] and exhibit the same levels of implicit bias as the wider population [5]. Improvements in clinician communication behaviors have the potential to disrupt negative associations between clinician implicit bias and patient satisfaction, trust, and outcomes [4]. For example, Cooper et al [4] demonstrated that clinicians who hold stronger racial biases express greater verbal dominance and slower speaking rates when interacting with Black patients compared to White patients. Thus, strategies directed at improving patient-clinician interactions, such as Implicit Bias Recognition and Management (IBRM) systems [14], can play a central role in mitigating implicit bias in healthcare, ultimately improving healthcare quality, access, and equity for patients from marginalized communities [15].

Effective strategies for combating implicit bias in healthcare require not only raising clinician awareness but also supporting active bias mitigation [18,19]. While educational interventions can promote short-term awareness, they often fail to achieve sustained bias reduction or improved clinical outcomes, necessitating complementary systemic changes [20]. Clinicians may experience discomfort or defensiveness when confronted with their biases, emphasizing the need for safe learning environments and ongoing support [21,22]. Health systems can prepare clinicians for effective patient interactions through simulated encounters and individualized feedback [14,23–26]. Recent research has begun to incorporate patient perspectives in bias recognition and management strategies, shifting towards more patient-centered approaches [27,28]. Engaging patients from marginalized communities is crucial for developing effective informatics interventions that align with patient needs and values, given the potential negative impact of biased clinical interactions on health outcomes [29–32].

Previous research has identified several dimensions of how implicit biases impact clinical interactions between healthcare providers and patients from marginalized communities. Building upon this work, we conducted a qualitative study using semi-structured interviews to elicit ideas from BIPOC and LGBTQ+ individuals for improving their interactions with clinicians. Our prior study identified six dimensions describing the impact of implicit biases on clinical interactions: *transactional care, power inequity, communication casualties, bias-embedded medicine, system-level problems, and bigotry in disguise* [29]. The current study addresses these dimensions by exploring strategies that BIPOC and LGBTQ+ patients recommend for improving their clinical encounters. Specifically, this research aims to answer the question: *What strategies do BIPOC and LGBTQ+ patients suggest for improving clinical interactions with their healthcare providers?*

Methods

Study Design

We conducted a qualitative study using semi-structured interviews to gather recommendations from BIPOC and LGBTQ+ patients on how to improve their interactions with clinicians during clinical encounters. Data collection included an online demographic survey followed by virtual interviews. Study procedures were reviewed and approved by the University of Washington's Institutional Review Board.

Participants & Recruitment

We recruited LGBTQ+ and/or BIPOC adults who speak English and reside in the United States. Participants were recruited through a convenience sampling method using flyers distributed via institutional networks, social media platforms, and "community champions" (BIPOC and LGBTQ+ patient representatives on the project's advisory board). Prospective participants contacted the research team via email or an online form. Eligible individuals were provided with study information, inclusion criteria, and consent forms for both the online survey and interview.

Data Collection

The online survey collected demographic information including age, gender, race, ethnicity, education, and self-identification as BIPOC and/or LGBTQ+. Semi-structured interviews were conducted via Zoom by two graduate student research assistants with qualitative research experience (RCP, CA). The interview guide was developed by the research team (AH, WP, JS, CL, RCP) and pilot tested (CL, RCP, DV) before recruitment. Interviews were conducted between June and November 2020, lasting approximately one hour each. With one exception, all interviews were conducted by both graduate student researchers (RCP & CA). Both researchers identify as Hispanic/Latino; one is a cisgender male (CA) and the other is transgender non-binary (RCP). Participants provided verbal consent for audio and video recording via Zoom. After describing incidents of perceived discrimination in clinical interactions, participants were asked: "*If you had the power to change how patients and doctors communicate to improve clinical interactions in the future, what would you change? Why?*" Interviews were recorded and transcribed verbatim. Interviewers documented initial themes following each interview. Data collection continued until thematic saturation was reached.

Data Analysis

Survey data were summarized using descriptive statistics to characterize the sample. We applied inductive thematic analysis [33] to interview transcripts to identify emergent themes through iterative coding. Three researchers (RCP, CL & DV) inductively created an initial codebook after reviewing the interview notes. The final analysis team comprised four members: a transgender non-binary Latino graduate student (RCP), a cisgender Latino male graduate student (CA), a cisgender White female undergraduate student (EB), and a cisgender Asian American female undergraduate student (DM). This team refined the codebook and coded all interviews. Each transcript was independently coded by two team members using Atlas.TI v.9. After individual coding, pairs met to discuss their coding and resolve discrepancies. The codebook was iteratively adjusted with the full team until consensus was reached.

Results

Participants

Twenty-five participants completed both the survey and the interview (PT01-PT25). Participants ranged in age from 19 to 60 years (M = 31, SD = 10). The majority were women, non-Hispanic/Latino, and college-educated (Table 1). Participants represented historically marginalized communities: eleven (44%) identified as BIPOC, ten (40%) as both BIPOC and LGBTQ+, and three (12%) as LGBTQ+. One participant (4%) did not explicitly identify as BIPOC or LGBTQ+ but described herself as an "older Asian woman."

Table 1. Participant characteristics

Characteristics		n=25
Age (years), mean (SD), range		31 (10), 19-60
Age, n(%)		
	18-29	15 (60%)
	30-50	9 (36%)
	50+	1 (4%)
Gender (participants could select more than one), n(%)		
	Man	4 (16%)
	Woman	17 (68%)
	Non-binary	5 (20%)
	Transgender	2 (8%)
	Gender fluid	1 (4%)
	Preferred not to disclose	0 (0%)
Race (participants could select more than one), n(%)		
	White	5 (20%)
	Black or African American	8 (32%)
	American Indian or Alaska Native	3 (12%)
	Chinese	5 (20%)
	Filipino	1 (4%)
	Asian Indian	4 (16%)

	Korean	1 (4%)
	Other Asian	1 (4%)
	Some other race (fill in): “Middle Eastern”, “Latinx”, “Mestizo”, “Taino”	4 (16%)
	Preferred not to disclose	0 (0%)
Ethnicity, n(%)		
	Not Hispanic, Latino or Spanish origin	18 (72%)
	Hispanic or Latino	6 (24%)
	Preferred not disclose	1 (4%)
Education, n(%)		
	Less than High school	1 (4%)
	High school graduate	1 (4%)
	Some college	4 (16%)
	Bachelor’s degree	12 (48%)
	Graduate/Professional degree	7 (28%)
	Preferred not to disclose	0 (0%)

Qualitative Themes

Our qualitative analysis of the interviews revealed five emerging themes: *(1) giving feedback to clinicians, (2) having a patient advocate, (3) enhancing clinicians' training, (4) diversifying healthcare workforce, and (5) amplifying positive experiences.* We describe each theme below with representative quotes.

Giving feedback to clinicians

Sixteen of the 25 participants (64%) suggested providing feedback to clinicians, either virtually or in-person, to improve communication. However, participants also expressed hesitation about giving direct feedback, primarily due to fears of repercussions or worsened experiences in subsequent appointments.

> *“I would hate to say something and* ***then go back to that doctor, and have a worse experience****. I mean it’s my health, I'd be scared honestly.”* (PT16, BIPOC woman)

To address these concerns, most participants preferred anonymous feedback mechanisms to mitigate fears of negative impacts on their care.

> *“I would definitely want* [the feedback] *to be anonymous.* ***Even if it's very constructive feedback... I don't want the doctor to take it personally****, especially if I'm trying to keep up a good relationship with that doctor.”* (PT01, BIPOC man)

One suggested approach was using surveys to alleviate anxiety associated with providing feedback.

> *“But I think as a person who has anxiety... I don't want to give* [my clinician] *a phone call and talk to them.* ***I would rather type it up and send an email****- or if there's a kiosk that I can go over to and fill it out before I leave, that'd be really nice.”* (PT09, White non-binary)

Participants proposed involving a third party, such as a social worker or clinical leader, to collect and summarize feedback after patients had time to reflect on their interactions.

> *"I don't know if the best course of action would be for them to go directly to a doctor* ***or maybe for another administrative staff to collect all the responses and provide an overview of the general feedback****. I think that might be a better option because a lot of times we're not always open to taking feedback. Especially if it's negative. I think it might be worthwhile for someone who's not the doctor… to collate that feedback and summarize it, like what the general overall tone of what the feedback is."* (PT12, BIPOC woman)

There was also a call for transparent accountability measures (*"checks and balances"* - PT10, BIPOC and LGBTQ+ woman), as participants expressed uncertainty about how feedback would be applied and whether it would lead to meaningful changes.

> *"****I would need to know more about what they do with those surveys or how they deal with some of the larger context issues****. I can guarantee there's some doctor somewhere that's been accused of being racist or not listening to a client [and] they still have their job. I'm not necessarily saying they should be fired, but I have never heard anyone being called back to apologize, or to say 'this was addressed in this way' so it doesn't seem like there's many checks and balances or accountability to the general public." (PT10, BIPOC and LGBTQ+ woman)*

Some participants suggested implementing review systems similar to Yelp.com, allowing patients to share experiences and inform others' decisions while encouraging clinicians to respond to negative feedback. Other ideas included a "*doctor of the month*" (PT03, BIPOC woman) initiative based on positive patient-clinician interactions. Participants also proposed using technology to provide real-time feedback during clinical encounters, such as ambient lighting changes or push notifications to alert clinicians about inadequate communication.

> *"Maybe if they have not been doing eye contact as they should (with the patient), they should have some reminder, like some kind of color comes out of the mirror maybe?...* ***Almost everyone in the office uses a pen, so maybe they can do something on the pen so if the doctors or nurses do things not the right way, the pen can [change] color and remind them that they did not handle it correctly.****" (PT03, Asian woman)*

Additionally, participants suggested patient-operated devices, such as a 'clicker,' to notify clinicians of communication gaps during visits.

> *"****[I want a] clicker [to alert] when there's something you don't understand or that you want to go over again.*** *I think one of the biggest parts of it is definitely that I don't know when to speak up, or I don't know if I speak up if I'm interrupting them, or if it's rude, or if it's embarrassing. So, kind of being able to do that without having to really jump into the conversation and get super technical would be really helpful." (PT05, BIPOC woman)*

Having a patient advocate

Fifteen of the 25 participants (60%) suggested incorporating patient advocates during clinic visits. These advocates would help balance the power dynamic between patients and clinicians, ensuring that marginalized groups are heard and receive quality care. Participants emphasized that patient advocates should possess cultural humility and undergo implicit bias recognition training to help clinicians better understand cultural differences and their impact on care provision.

> "**[A patient advocate is] someone that is aware of their biases and check them, seeks to hear from people**, and believes that the input they are going to receive is something that's going

> to make the institution better and they are actually going to implement some things." (PT16, BIPOC woman)

Participants often felt intimidated by clinicians' authority, limiting their ability to self-advocate. They stressed the importance of patient advocates having similar or greater influence as clinicians within the healthcare facility to adequately address patients' needs while helping patients develop self-advocacy skills.

> *"**As a patient, you doubt your own knowledge, even of yourself, because we've been trained to think that doctors are the experts of the human body**. The times that I was able to advocate for myself most was after the fact after I had time to process, it wasn't necessarily in the moment... You don't even have the kind of energy or mental agility to process a microaggression or a bias, or to calm your anxiety enough to tell some person to speak to you with respect... [the patient advocate] could watch the cues… When I'm uncomfortable it's all over my face." (PT06, BIPOC and LGBTQ+ woman)*

Patient advocates could also assist in navigating the healthcare system, which patients often described as unwelcoming and confusing.

> *"I want to know, 'Hey, I'm here to help you navigate this healthcare process.' **It would be nice to know that this is the individual who can help you.** You may not need them right now. But, I just feel like it's nice to know why they're there." (PT14, BIPOC and LGBTQ+ woman)*

While most participants envisioned human patient advocates present during clinical visits, some suggested technology could serve a similar role, such as a robot capable of sensing implicit bias.

> *"I think it would be useful in the doctor's office to say 'wait, let the patient talk', because I feel like doctors are always in a rush… **It'd be so cool if Baymax [an AI healthcare robot from a Disney movie] could sense implicit bias.** I don't really know what other people of color's experiences at the doctor are, but I could imagine that they're also being dismissed and not realizing it, because they're so used to it. Especially people who grew up in cultures where they are the minority. I think some people may have gotten used to it and they might need someone to be the advocate and say 'this is not right, let this person tell their own story.'" (PT02, BIPOC woman)*

Technology could act as a mediator between patients and clinicians by "*reading the room*" (PT05, BIPOC woman & PT22, White transgender woman) to provide real-time feedback to clinicians when interactions are not going well and validating patients' feelings of dismissal.

Enhancing clinicians' training

Twenty-four of the 25 participants (96%) suggested improvements to clinician training as strategies to enhance healthcare interactions. Participants expressed concerns about medical education and communication skills training, particularly regarding clinicians' knowledge of race- and ethnicity-based medical disparities, and awareness of specific health needs related to sexual orientation and gender identity. They emphasized the importance of incorporating cultural humility and LGBTQ+ health components into medical education curricula.

> *"I don't know if [healthcare clinicians] get training… **specifically regarding disparities and cultural competence and multicultural patient care.**" (PT10, BIPOC and LGBTQ+ woman)*

Participants noted a disconnect between what they believe clinicians are taught and what occurs in clinical practice:

> *"There's always that struggle that myself and other members in the [LGBTQ+] community*

> *have,* ***did they just need any education or are they just discriminating and being prejudiced against us?****" (PT01, BIPOC man)*

To bridge this gap, participants suggested workshops featuring real patient stories to help clinicians understand the impact of poor clinical interactions on marginalized groups and the importance of consciously combating implicit bias in healthcare:

> *"I think training… is where actual change may happen. So* ***being able to give them real life scenarios or talk them through what works well and what doesn't and what patients enjoy and what they don't****, beforehand [to give] them as a frame of reference. Then the next time they go into a conversation with the patient… they kind of have a frame of reference from training of 'here are some actual conversations from patients that have experienced micro aggressions or other types of bias. And here's how we can fix it.'" (PT08, BIPOC and LBGTQ+ woman)*

Participants emphasized that anti-bias training should be as integral to medical education as other clinical courses:

> *"Just training, changing medical textbooks and people who work in the field, nurses and all,* ***to have some sort of anti-bias training, or knowledge of other cultures and other genders and sexualities****, aside from the dominant ones." (PT25, White transgender non-binary)*

There was concern that clinicians lack training in empathy, compassion, and effective communication with patients from marginalized communities:

> *"[Clinicians] have all this training, but to be able to communicate what's going on is a skill that I think is overlooked a lot… A lot of trans people, people of color, are poor. They come from underprivileged backgrounds. They may have been kicked out when they were young… not able to finish school and they're not going to have all that background knowledge…* ***to communicate effectively with someone with not even the baseline knowledge is a skill that I feel is sorely lacking in the medical field.****" (PT22, White transgender woman)*

Participants highlighted the need for clinicians to have access to reliable resources regarding the healthcare needs of BIPOC and LGBTQ+ patients:

> *"There needs to be a place that's localized on the internet, like an international database that has accessible information for everybody that's very specific to LGBTQ+ people,* ***a known source for good information so that when we tell people to do some research, they're not looking up a Christian Republican White view of LGBT people, a credible source.****" (PT09, White non-binary)*

They also expressed willingness to educate clinicians about their personal healthcare needs if clinicians openly acknowledged their limited knowledge of BIPOC and LGBTQ+ healthcare:

> *"If the doctor was like, 'I need to be more educated about this community. Can you tell me about what your struggles are?' If my doctor asked me* ***I would be comfortable telling him about the community, I wouldn't judge him.*** *But, I think it'd be nice if doctors could be upfront if they're not too educated about it." (PT01, BIPOC man)*

Participants suggested developing tools to help patients disclose past poor clinical experiences and guide clinicians in considering such disclosures when providing care:

> *"Our initial visit is when [the clinician] starts to compile information about the patient and there should be resources available when they start to have a breakdown of cultural differences. We've seen historically how certain groups of people are treated. My abuelita [Spanish word for grandmother] does not trust doctors because of what they did to put her and other women in jail.* ***Just knowing that there might be a lot of distrust in the beginning of a conversation and***

> ***then having tools to open up for allowing someone to communicate.**” (PT15, BIPOC and LGBTQ+ man)*

Other proposed solutions included implementing a universal checklist to ensure equitable quality of care for all patients:

> *“**A check off list to make sure clinicians treat patients equally.** Treat everyone fair, respect each other, no matter what race, you now repeat things over and over again so, people won't forget.” (PT02, BIPOC woman)*

Diversifying healthcare workforce

Twelve of the 25 participants (48%) suggested diversifying the healthcare workforce as a strategy to improve their interactions with clinicians. Participants expressed that receiving care from clinicians with similar backgrounds could enhance patient comfort in explaining health concerns and foster better understanding. While some participants acknowledged growing diversity among clinicians, they noted that healthcare facilities rarely disclose information about clinicians' cultural backgrounds, which would allow patients to find providers with similar backgrounds to their own:

> *“**I've been calling ahead and asking if they have any physicians of color.** I actually had to go to physical therapy and they didn't have any... He was like, ‘I'm embarrassed that we don't have any and I understand why you are requesting this’ and I just felt like even the way he touched me was different, you know, I felt like he had a more empathetic view, just like ‘okay, she's identified that this can be an issue. I'm going to try to do everything I can to not make her feel like this, right.’” (PT16, BIPOC woman)*

Many participants emphasized the need for greater cultural representation among clinicians:

> *“It's also a matter of having more people of color in healthcare. I think that's a huge thing because when your doctor looks like you, they understand your experience in a more enjoyable, empathetic way. Patient experience improves as well because you know that this person empathizes with you and understands various struggles that you have gone through… **I've never really had the opportunity to pick out a doctor who is of a culture that's more similar to mine.**” (PT08, BIPOC and LBGTQ+ woman)*

Although participants recognized the value of translators for non-English speaking patients, they described this as a suboptimal solution. Some participants expressed that having a clinician who speaks the patient's first language would be ideal, allowing patients to feel more comfortable speaking for themselves and avoiding potential translation issues:

> *“**The first language of their patient is ideal**, because then there's no translating issues and there's no making up words and even if there's a word that you're not sure about, I'm sure you could get there through conversation.”* (PT13, BIPOC woman)

Amplifying positive experiences

Twenty of the 25 participants (80%) contrasted negative experiences of not feeling heard against positive interactions with clinicians. These positive experiences, characterized by patients feeling heard and receiving appropriate care, can provide valuable guidance for future improvements in patient-clinician interactions. Participants identified three key factors contributing to positive healthcare experiences: the clinician listened to and believed the patient without making assumptions, made a clear effort to build a relationship, and balanced the existing power dynamic with the patient.

Participants described feeling heard and believed when clinicians asked questions to gain a deeper understanding rather than making assumptions:

> *"I sat down with* [the clinician]. ***He just listened to me. He listened to what I was saying, and he asked me questions, some of the same questions that other people asked me, but in a way to where he actually cared about the answer.*** *It was night and day. And it felt good."* (PT14, BIPOC and LGBTQ+ woman)

PT13 elaborated on the importance of thorough explanations and establishing trust:

> *"**Taking the time to explain to a patient why*** **[a treatment plan is]** ***not a possibility or answering all your patients' questions fully.*** *Understanding where they're coming from instead of assuming… I think a big thing is establishing that initial trust between the doctor and the patient. I like that doctor that I used to have at the community clinic. I feel like I always felt really comfortable with her because she took the time to get to know me… just building that initial rapport with your patient in order to establish trust and establish an open line of communication… I think that's a big thing."* (PT13, BIPOC woman)

Participants highlighted specific communication cues that can help neutralize the power difference between patients and clinicians. These include establishing eye contact, being at the patient's eye level, and giving the patient time to respond: *"Turning his screen to me and showing me everything…* ***I think he was on a raised seat and he lowered it, so we were eye level****"* (PT15, BIPOC and LGBTQ+ man).

PT20 further emphasized the importance of attentive body language:

"She just made eye contact, didn't seem in a hurry to send me away. I felt it was much more customer friendly… ***She was attentive. Her body language was just much more unhurried****, and I think the body language makes a huge difference."* (PT20, BIPOC woman).

Discussion

Implicit bias is a significant contributor to health and healthcare inequities [5,34], negatively impacting patient-clinician interactions [4]. Previous research has explored various clinician-facing interventions to address implicit bias, such as Implicit Bias Recognition and Management (IBRM) [35,36]. Additionally, studies have investigated the potential of technology to provide real-time [37–39] and reflective [40] feedback to clinicians for improving their communication with patients. Successful mitigation of implicit bias requires clinicians to first become aware of their own biases before learning strategies to overcome them [18].

However, patients' perspectives on potential strategies to address implicit bias have been largely unexplored. Our interview study addresses this gap by characterizing implicit bias mitigation strategies suggested by Black, Indigenous, and People of Color (BIPOC) and Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ+) patients to improve their communication with clinicians during clinical interactions. Our analysis identified five patient-generated strategies to enhance interactions between clinicians and patients from marginalized communities:

1. Giving feedback to clinicians
2. Having a patient advocate
3. Enhancing clinicians' training
4. Diversifying healthcare workforce
5. Amplifying positive experiences

These findings provide novel insights into patient-centered approaches for addressing implicit bias in healthcare settings. Our prior research established a framework depicting how BIPOC and LGBTQ+ patients describe the impact of implicit bias on their interactions with clinicians [29], later expanded to include patients' responses and health-related consequences of these experiences [41]. This framework comprises six dimensions: Transactional care, Power inequity, Communication casualties, Bias-embedded medicine, System-level problems, Bigotry in disguise. The five patient-generated strategies identified in our current study align with these dimensions, except for System-level problems, as participants were not specifically asked about improving interactions with the healthcare system.

Below, we will explore how these patient-generated strategies can address the aforementioned dimensions using an informatics approach, moving towards patient-centered, equitable care. Our approach considers technology as a supportive tool for clinicians to improve interactions with patients from marginalized communities, rather than adopting a purely technocentric approach, which can perpetuate bias [42].

Giving feedback to clinicians can address *Power inequity* by mitigating the inherent power imbalance between patients and providers that affects rapport building. Unlike prior feedback systems [14,19,21,26] that did not consider this power difference, this approach not only raises awareness of implicit bias but also centers the interaction on patients' experiences, ensuring their needs, values, and priorities are met [43,44]. Future informatics research should develop tools and implement processes allowing patients to provide both positive and negative feedback to clinicians [45], integrating these as part of clinicians' continual training [46,47]. Such interventions could leverage existing online review systems [48] or emerging technologies that provide feedback on communication cues [37–40,49], including body language signals indicative of implicit bias [4,5,50,51].

Having a patient advocate can address *Communication casualties* (i.e., verbal or non-verbal cues that the patient identified as uncomfortable, awkward, or inappropriate). By including culturally competent patient advocates, patients' voices could be amplified to include their perspectives and experiences about the care they receive [52]. Patient advocates can help patients gain the courage to self-advocate and assist clinicians in providing appropriate care that ensures patients' needs and values are heard and respected [53]. This strategy can leverage technology for providing digital companionship through the use of chatbots or artificial intelligence [54–56]. Including human or automated advocates could foster health equity, promote patient empowerment, and address deeply-rooted clinical mistrust among marginalized communities [52,57]. Future informatics research should consider the opportunity to connect patients with advocates of their choosing who share similar backgrounds.

Enhancing clinicians' training addresses *Bias-embedded medicine* (i.e., instances in which the patient felt they were treated unfairly because of their personal characteristics, such as race, ethnicity, gender identity, sexual orientation or physical characteristics like weight). This enhancement should include tools and resources that support clinicians to identify and acknowledge their implicit biases [43,58], continued training for clinicians to improve their communication skills [25,59], and opportunities to advance their medical knowledge regarding culturally appropriate care for BIPOC and LGBTQ+ patients [60]. Additionally, health systems could implement checklists and dashboards dedicated to promoting health equity among patients, to ensure all patients receive equitable care [61,62]. Nonetheless, as implicit bias is a human problem, technology should be a resource that humans can leverage for managing information better, but not be considered as the sole solution. Developers can inadvertently transfer their own prejudices and stereotypes into technology, creating systems that perpetuate biases [42] and continue to harm underserved communities [63].

Diversifying healthcare workforce addresses *Bigotry in disguise* (i.e., when participants perceive providers to have implicit discriminatory attitudes or behaviors towards BIPOC or LGBTQ+ patients). By promoting systemic change to encourage and support the recruitment of clinicians with diverse backgrounds, patients from marginalized communities can experience better communication [64] as the patient-clinician relationship is strengthened when patients can see themselves as similar to their clinicians [65,66]. Digital tools should display information regarding clinicians' biographies to promote relevant cultural information and allow patients to make informed decisions on which clinician they should connect with [67,68]. Additionally, it is crucial to diversify health informatics professionals to improve the quality of research and practice [69]. By having a more diverse workforce, health informatics professionals can better understand and incorporate the unique health needs of these populations into the development and implementation of health informatics technologies [70]. Moreover, it is essential to account for the health needs and perspectives of patients from marginalized communities when conducting health informatics research. Doing so will help to ensure that research findings are relevant and applicable to these populations, ultimately leading to more equitable and effective healthcare outcomes for all [71].

Amplifying positive experiences addresses *Transactional care* (i.e., when providers treat an appointment as a job rather than an opportunity to look after the patients' well-being). By identifying positive moments and recognizing the actions and attitudes that contribute to making experiences positive, there is an opportunity to model these experiences for equitable interactions between clinicians and patients from marginalized communities [72]. Focusing on good experiences can be useful for tailoring interventions that will prepare clinicians to provide the best possible care [68,73]. Research could leverage automated tools to analyze online reviews [48] for finding positive feedback and to create a dissemination strategy. This approach could help address patients' mistrust in healthcare and clinicians' burnout by acknowledging the importance and efforts being made to provide culturally competent care [57,74].

Limitations and Implications

This study has several limitations and strengths. Due to the COVID-19 pandemic, study procedures were conducted virtually, which may have skewed the participant sample towards younger, tech-savvy, and college-educated individuals [75]. However, we successfully captured diverse perspectives from BIPOC and LGBTQ+ people and conducted a rigorous qualitative analysis to characterize patients' voices [76]. Our findings have important implications for future research and practice. Future work should employ co-design methods with patients and clinicians to develop tools that can improve patient-clinician interactions, considering the needs and values of both stakeholder groups [77]. Additionally, future studies should aim to include a broader demographic range, particularly older adults and those with limited technological access or literacy [78].

Conclusions

Through interviews with BIPOC and LGBTQ+ individuals, we have characterized patient-generated strategies for improving patient-clinician interactions and addressing implicit bias. These strategies, which add the patient's voice and perspective, are organized into five themes: *(1) giving feedback to clinicians, (2) having a patient advocate, (3) enhancing clinicians' training, (4) diversifying healthcare workforce, and (5) amplifying positive experiences.* We have matched these strategies with patient experiences of unfair treatment reported in prior work, presenting informatics research opportunities for each strategy. These findings aim to ensure that patients from marginalized communities have equitable clinical interactions that align with their values and needs.

Our study underscores the importance of patient-centered approaches in addressing implicit bias in healthcare settings. By integrating these patient-generated strategies into healthcare practices and informatics solutions, we can work towards more equitable, respectful, and effective healthcare delivery for all patients, regardless of their background or identity. This research contributes to the ongoing effort to reduce health disparities and improve the quality of care for marginalized communities.

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Conflicts of Interest

None declared.

Abbreviations

BIPOC: Black, Indigenous, and People of Color
LGBTQ+: Lesbian, gay, bisexual, transgender, and queer
IBRM: Implicit bias recognition and management systems

References

1. Maina IW, Belton TD, Ginzberg S, Singh A, Johnson TJ. A decade of studying implicit racial/ethnic bias in healthcare providers using the implicit association test. Social Science & Medicine 2018 Feb 1;199:219–229. doi: 10.1016/j.socscimed.2017.05.009
2. Shavers VL, Klein WMP, Fagan P. Research on Race/Ethnicity and Health Care Discrimination: Where We Are and Where We Need to Go. Am J Public Health 2012 Apr 11;102(5):930–932. doi: 10.2105/AJPH.2012.300708
3. Hall WJ, Chapman MV, Lee KM, Merino YM, Thomas TW, Payne BK, Eng E, Day SH, Coyne-Beasley T. Implicit Racial/Ethnic Bias Among Health Care Professionals and Its Influence on Health Care Outcomes: A Systematic Review. Am J Public Health 2015 Oct 15;105(12):e60–e76. doi: 10.2105/AJPH.2015.302903
4. Cooper LA, Roter DL, Carson KA, Beach MC, Sabin JA, Greenwald AG, Inui TS. The Associations of Clinicians’ Implicit Attitudes About Race With Medical Visit Communication and Patient Ratings of Interpersonal Care. Am J Public Health 2012 Mar 15;102(5):979–987. doi: 10.2105/AJPH.2011.300558
5. FitzGerald C, Hurst S. Implicit bias in healthcare professionals: a systematic review. BMC Medical Ethics 2017 Mar 1;18(1):19. doi: 10.1186/s12910-017-0179-8
6. Green AR, Carney DR, Pallin DJ, Ngo LH, Raymond KL, Iezzoni LI, Banaji MR. Implicit Bias among Physicians and its Prediction of Thrombolysis Decisions for Black and White Patients. J GEN INTERN MED 2007 Sep 1;22(9):1231–1238. doi: 10.1007/s11606-007-0258-5
7. Schulman KA, Berlin JA, Harless W, Kerner JF, Sistrunk S, Gersh BJ, Dubé R, Taleghani CK, Burke JE, Williams S, Eisenberg JM, Ayers W, Escarce JJ. The Effect of Race and Sex on Physicians’ Recommendations for Cardiac Catheterization. New England Journal of Medicine 1999 Feb 25;340(8):618–626. PMID:10029647
8. Eichelberger KY, Doll K, Ekpo GE, Zerden ML. Black Lives Matter: Claiming a Space for Evidence-Based Outrage in Obstetrics and Gynecology. Am J Public Health 2016 Sep 14;106(10):1771–1772. doi: 10.2105/AJPH.2016.303313

9. Tamayo-Sarver JH, Hinze SW, Cydulka RK, Baker DW. Racial and Ethnic Disparities in Emergency Department Analgesic Prescription. Am J Public Health 2003 Dec 1;93(12):2067–2073. doi: 10.2105/AJPH.93.12.2067
10. Singh S, Durso LE. Widespread Discrimination Continues to Shape LGBT People’s Lives in Both Subtle and Significant Ways. Center for American Progress. 2017. Available from: https://www.americanprogress.org/issues/lgbtq-rights/news/2017/05/02/429529/widespread-discrimination-continues-shape-lgbt-peoples-lives-subtle-significant-ways/ [accessed Mar 1, 2021]
11. Clark F. Discrimination against LGBT people triggers health concerns. The Lancet 2014 Feb;383(9916):500–502. doi: 10.1016/S0140-6736(14)60169-0
12. Turban JL, Loo SS, Almazan AN, Keuroghlian AS. Factors Leading to “Detransition” Among Transgender and Gender Diverse People in the United States: A Mixed-Methods Analysis. LGBT Health Mary Ann Liebert, Inc., publishers; 2021 Jun;8(4):273–280. doi: 10.1089/lgbt.2020.0437
13. Ram A, Kronk CA, Eleazer JR, Goulet JL, Brandt CA, Wang KH. Transphobia, encoded: an examination of trans-specific terminology in SNOMED CT and ICD-10-CM. Journal of the American Medical Informatics Association 2022 Feb 1;29(2):404–410. doi: 10.1093/jamia/ocab200
14. Sukhera J, Watling CJ, Gonzalez CM. Implicit Bias in Health Professions: From Recognition to Transformation. Academic Medicine 2020 May;95(5):717–723. doi: 10.1097/ACM.0000000000003173
15. Hagiwara N, Elston Lafata J, Mezuk B, Vrana SR, Fetters MD. Detecting implicit racial bias in provider communication behaviors to reduce disparities in healthcare: Challenges, solutions, and future directions for provider communication training. Patient Education and Counseling 2019 Sep 1;102(9):1738–1743. doi: 10.1016/j.pec.2019.04.023
16. Ramani S, Krackov SK. Twelve tips for giving feedback effectively in the clinical environment. Medical Teacher 2012 Oct 1;34(10):787–791. PMID:22730899
17. Ha JF, Longnecker N. Doctor-Patient Communication: A Review. Ochsner J 2010;10(1):38–43. PMID:21603354
18. Chapman EN, Kaatz A, Carnes M. Physicians and Implicit Bias: How Doctors May Unwittingly Perpetuate Health Care Disparities. J GEN INTERN MED 2013 Nov 1;28(11):1504–1510. doi: 10.1007/s11606-013-2441-1
19. Zeidan AJ, Khatri UG, Aysola J, Shofer FS, Mamtani M, Scott KR, Conlon LW, Lopez BL. Implicit Bias Education and Emergency Medicine Training: Step One? Awareness. AEM Educ Train 2019 Jan;3(1):81–85. PMID:30680351
20. Vela MB, Erondu AI, Smith NA, Peek ME, Woodruff JN, Chin MH. Eliminating Explicit and Implicit Biases in Health Care: Evidence and Research Needs. Annu Rev Public Health 2022 Apr 5;43:477–501. PMID:35020445
21. Sukhera J, Wodzinski M, Milne A, Teunissen PW, Lingard L, Watling C. Implicit Bias and the Feedback Paradox: Exploring How Health Professionals Engage With Feedback While Questioning Its Credibility. Acad Med 2019 Aug;94(8):1204–1210. PMID:31045605
22. Gonzalez CM, Noah YS, Correa N, Archer-Dyer H, Weingarten-Arams J, Sukhera J. Qualitative analysis of medical student reflections on the implicit association test. Med Educ 2021 Jun;55(6):741–748. PMID:33544914
23. Kenny P, Parsons T, Gratch J, Rizzo A. Virtual humans for assisted health care. Proceedings of the 1st international conference on PErvasive Technologies Related to Assistive Environments New York, NY, USA: Association for Computing Machinery; 2008. p. 1–4. doi: 10.1145/1389586.1389594
24. Kleinsmith A, Rivera-Gutierrez D, Finney G, Cendan J, Lok B. Understanding Empathy Training with Virtual Patients. Comput Human Behav 2015 Nov 1;52:151–158.

PMID:26166942

25. Kron FW, Fetters MD, Scerbo MW, White CB, Lypson ML, Padilla MA, Gliva-McConvey GA, Belfore LA, West T, Wallace AM, Guetterman TC, Schleicher LS, Kennedy RA, Mangrulkar RS, Cleary JF, Marsella SC, Becker DM. Using a computer simulation for teaching communication skills: A blinded multisite mixed methods randomized controlled trial. Patient Educ Couns 2017 Apr;100(4):748–759. PMID:27939846
26. Dirks L, Beneteau E, Sabin J, Pratt W, Lane C, Bascom E, Casanova-Perez R, Rizvi N, Weibel N, Hartzler A. Battling Bias in Primary Care Encounters: Informatics Designs to Support Clinicians. Extended Abstracts of the 2022 CHI Conference on Human Factors in Computing Systems New York, NY, USA: Association for Computing Machinery; 2022. p. 1–9. doi: 10.1145/3491101.3519825
27. Gonzalez CM, Walker SA, Rodriguez N, Karp E, Marantz PR. It Can Be Done! A Skills-Based Elective in Implicit Bias Recognition and Management for Preclinical Medical Students. Acad Med 2020 Dec;95(12S Addressing Harmful Bias and Eliminating Discrimination in Health Professions Learning Environments):S150–S155. PMID:32889927
28. Yang C, Coney L, Mohanraj D, Casanova-Perez R, Bascom E, Efrem N, Garcia JT, Sabin J, Pratt W, Weibel N, Hartzler AL. Imagining Improved Interactions: Patients' Designs To Address Implicit Bias. AMIA Annu Symp Proc 2023;2023:774–783. PMID:38222327
29. Casanova-Perez R, Apodaca C, Bascom E, Mohanraj D, Lane C, Vidyarthi D, Beneteau E, Sabin J, Pratt W, Weibel N, Hartzler AL. Broken down by bias: Healthcare biases experienced by BIPOC and LGBTQ+ patients. AMIA Annu Symp Proc 2022 Feb 21;2021:275–284. PMID:35308990
30. Nong P, Raj M, Creary M, Kardia SLR, Platt JE. Patient-Reported Experiences of Discrimination in the US Health Care System. JAMA Network Open 2020 Dec 15;3(12):e2029650. doi: 10.1001/jamanetworkopen.2020.29650
31. Hausmann LRM, Jones AL, McInnes SE, Zickmund SL. Identifying healthcare experiences associated with perceptions of racial/ethnic discrimination among veterans with pain: A cross-sectional mixed methods survey. PLOS ONE Public Library of Science; 2020 Sep 3;15(9):e0237650. doi: 10.1371/journal.pone.0237650
32. Street RL, Gordon H, Haidet P. Physicians' communication and perceptions of patients: Is it how they look, how they talk, or is it just the doctor? Social Science & Medicine 2007 Aug 1;65(3):586–598. doi: 10.1016/j.socscimed.2007.03.036
33. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Research in Psychology Routledge; 2006 Jan 1;3(2):77–101. doi: 10.1191/1478088706qp063oa
34. Institute of Medicine (US) Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care. Smedley BD, Stith AY, Nelson AR, editors. Washington (DC): National Academies Press (US); 2003. PMID:25032386
35. Blair IV, Steiner JF, Havranek EP. Unconscious (Implicit) Bias and Health Disparities: Where Do We Go from Here? Perm J 2011;15(2):71–78. PMID:21841929
36. Gonzalez CM, Garba RJ, Liguori A, Marantz PR, McKee MD, Lypson ML. How to Make or Break Implicit Bias Instruction: Implications for Curriculum Development. Acad Med 2018 Nov;93(11S Association of American Medical Colleges Learn Serve Lead: Proceedings of the 57th Annual Research in Medical Education Sessions):S74–S81. PMID:30365433
37. Faucett HA, Lee ML, Carter S. I Should Listen More: Real-time Sensing and Feedback of Non-Verbal Communication in Video Telehealth. Proc ACM Hum-Comput Interact 2017 Dec 6;1(CSCW):44:1-44:19. doi: 10.1145/3134679
38. Hartzler AL, Patel RA, Czerwinski M, Pratt W, Roseway A, Chandrasekaran N, Back A. Real-time feedback on nonverbal clinical communication. Theoretical framework and clinician acceptance of ambient visual design. Methods Inf Med 2014;53(5):389–405. PMID:24970354

39. Weibel N, Rick S, Emmenegger C, Ashfaq S, Calvitti A, Agha Z. LAB-IN-A-BOX: semi-automatic tracking of activity in the medical office. Pers Ubiquit Comput 2015 Feb 1;19(2):317–334. doi: 10.1007/s00779-014-0821-0
40. Liu C, Lim RL, McCabe KL, Taylor S, Calvo RA. A Web-Based Telehealth Training Platform Incorporating Automated Nonverbal Behavior Feedback for Teaching Communication Skills to Medical Students: A Randomized Crossover Study. J Med Internet Res 2016 Sep 12;18(9):e246. PMID:27619564
41. Apodaca C, Casanova-Perez R, Bascom E, Mohanraj D, Lane C, Vidyarthi D, Beneteau E, Sabin J, Pratt W, Weibel N, Hartzler AL. Maybe they had a bad day: how LGBTQ and BIPOC patients react to bias in healthcare and struggle to speak out. Journal of the American Medical Informatics Association 2022 Dec 1;29(12):2075–2082. doi: 10.1093/jamia/ocac142
42. Benjamin R. Race After Technology: Abolitionist Tools for the New Jim Code | Wiley. Polity Press; 2019. ISBN:1-5095-2643-9
43. Sukhera J, Watling C. A Framework for Integrating Implicit Bias Recognition Into Health Professions Education. Acad Med 2018 Jan;93(1):35–40. PMID:28658015
44. Hagiwara N, Kron FW, Scerbo MW, Watson GS. A call for grounding implicit bias training in clinical and translational frameworks. Lancet 2020 May 2;395(10234):1457–1460. PMID:32359460
45. Hardavella G, Aamli-Gaagnat A, Saad N, Rousalova I, Sreter KB. How to give and receive feedback effectively. Breathe (Sheff) 2017 Dec;13(4):327–333. PMID:29209427
46. Burgess A, van Diggele C, Roberts C, Mellis C. Feedback in the clinical setting | BMC Medical Education | Full Text. BMC Med Educ 2020 Dec 3;20(Suppl 2):460. doi: https://doi.org/10.1186/s12909-020-02280-5
47. Byrne A, Tanesini A. Instilling new habits: addressing implicit bias in healthcare professionals. Adv Health Sci Educ Theory Pract 2015 Dec;20(5):1255–1262. PMID:25771742
48. Dunivin Z, Zadunayski L, Baskota U, Siek K, Mankoff J. Gender, Soft Skills, and Patient Experience in Online Physician Reviews: A Large-Scale Text Analysis. Journal of Medical Internet Research 2020 Jul 30;22(7):e14455. doi: 10.2196/14455
49. Ryan P, Luz S, Albert P, Vogel C, Normand C, Elwyn G. Using artificial intelligence to assess clinicians' communication skills. BMJ British Medical Journal Publishing Group; 2019 Jan 18;364:l161. PMID:30659013
50. Hagiwara N, Mezuk B, Elston Lafata J, Vrana SR, Fetters MD. Study protocol for investigating physician communication behaviours that link physician implicit racial bias and patient outcomes in Black patients with type 2 diabetes using an exploratory sequential mixed methods design. BMJ Open 2018 Oct 18;8(10):e022623. PMID:30341127
51. Teal CR, Gill AC, Green AR, Crandall S. Helping medical learners recognise and manage unconscious bias toward certain patient groups. Med Educ 2012 Jan;46(1):80–88. PMID:22150199
52. Natale-Pereira A, Enard KR, Nevarez L, Jones LA. The role of patient navigators in eliminating health disparities. Cancer 2011;117(S15):3541–3550. doi: 10.1002/cncr.26264
53. Phillips S, Villalobos AVK, Crawbuck GSN, Pratt-Chapman ML. In their own words: patient navigator roles in culturally sensitive cancer care. Support Care Cancer 2019 May;27(5):1655–1662. doi: 10.1007/s00520-018-4407-7
54. Kramer J, Yinusa-Nyahkoon L, Olafsson S, Penti B, Woodhams E, Bickmore T, Jack BW. Black Men's Experiences With Health care: Individuals' Accounts of Challenges, Suggestions for Change, and the Potential Utility of Virtual Agent Technology to Assist Black Men With Health Management. Qual Health Res 2021 Aug;31(10):1772–1785. PMID:34092141
55. Morley J, Floridi L. Enabling digital health companionship is better than empowerment. The Lancet Digital Health Elsevier; 2019 Aug 1;1(4):e155–e156. PMID:33323183
56. Bickmore TW, Trinh H, Olafsson S, O'Leary TK, Asadi R, Rickles NM, Cruz R. Patient and

Consumer Safety Risks When Using Conversational Assistants for Medical Information: An Observational Study of Siri, Alexa, and Google Assistant. J Med Internet Res 2018 Sep 4;20(9):e11510. PMID:30181110

57. Alsan M, Garrick O, Graziani G. Does Diversity Matter for Health? Experimental Evidence from Oakland. American Economic Review 2019 Dec;109(12):4071–4111. doi: 10.1257/aer.20181446
58. Project Implicit. Take a Test. Available from: https://implicit.harvard.edu/implicit/takeatest.html [accessed Aug 31, 2022]
59. Bickmore T, Parmar D, Kimani E, Olafsson S. Diversity Informatics: Reducing Racial and Gender Bias with Virtual Agents. Proceedings of the 21st ACM International Conference on Intelligent Virtual Agents New York, NY, USA: Association for Computing Machinery; 2021. p. 25–32. doi: 10.1145/3472306.3478365
60. Keuroghlian AS, Ard KL, Makadon HJ. Advancing health equity for lesbian, gay, bisexual and transgender (LGBT) people through sexual health education and LGBT-affirming health care environments. Sex Health 2017;14(1):119. doi: 10.1071/SH16145
61. Tsuchida RE, Haggins AN, Perry M, Chen C-M, Medlin RP, Meurer WJ, Burkhardt J, Fung CM. Developing an electronic health record-derived health equity dashboard to improve learner access to data and metrics. AEM Educ Train 2021 Sep;5(Suppl 1):S116–S120. PMID:34616984
62. Chin MH, Clarke AR, Nocon RS, Casey AA, Goddu AP, Keesecker NM, Cook SC. A roadmap and best practices for organizations to reduce racial and ethnic disparities in health care. J Gen Intern Med 2012 Aug;27(8):992–1000. PMID:22798211
63. Obermeyer Z, Powers B, Vogeli C, Mullainathan S. Dissecting racial bias in an algorithm used to manage the health of populations. Science 2019 Oct 25;366(6464):447–453. PMID:31649194
64. Shen MJ, Peterson EB, Costas-Muñiz R, Hernandez MH, Jewell ST, Matsoukas K, Bylund CL. The Effects of Race and Racial Concordance on Patient-Physician Communication: A Systematic Review of the Literature. J Racial Ethn Health Disparities 2018 Feb;5(1):117–140. PMID:28275996
65. Street RL, O’Malley KJ, Cooper LA, Haidet P. Understanding Concordance in Patient-Physician Relationships: Personal and Ethnic Dimensions of Shared Identity. Ann Fam Med 2008 May;6(3):198–205. PMID:18474881
66. Saha S, Komaromy M, Koepsell TD, Bindman AB. Patient-physician racial concordance and the perceived quality and use of health care. Arch Intern Med 1999 May 10;159(9):997–1004. PMID:10326942
67. Kepper MM, Walsh-Bailey C, Brownson RC, Kwan BM, Morrato EH, Garbutt J, de Las Fuentes L, Glasgow RE, Lopetegui MA, Foraker R. Development of a Health Information Technology Tool for Behavior Change to Address Obesity and Prevent Chronic Disease Among Adolescents: Designing for Dissemination and Sustainment Using the ORBIT Model. Front Digit Health 2021;3:648777. PMID:34713122
68. Agency for Healthcare Research and Quality. Question Builder. Available from: https://www.ahrq.gov/questions/question-builder/online.html [accessed Aug 31, 2022]
69. Chou W-YS, Oh A, Klein WMP. Addressing Health-Related Misinformation on Social Media. JAMA 2018 Dec 18;320(23):2417–2418. doi: 10.1001/jama.2018.16865
70. Brewer LC, Fortuna KL, Jones C, Walker R, Hayes SN, Patten CA, Cooper LA. Back to the Future: Achieving Health Equity Through Health Informatics and Digital Health. JMIR Mhealth Uhealth 2020 Jan 14;8(1):e14512. PMID:31934874
71. Veinot TC, Mitchell H, Ancker JS. Good intentions are not enough: how informatics interventions can worsen inequality. J Am Med Inform Assoc 2018 Aug 1;25(8):1080–1088. PMID:29788380
72. Burgess DJ, Phelan S, Workman M, Hagel E, Nelson DB, Fu SS, Widome R, van Ryn M. The

effect of cognitive load and patient race on physicians' decisions to prescribe opioids for chronic low back pain: a randomized trial. Pain Med 2014 Jun;15(6):965–974. PMID:24506332

73. Beach MC, Roter D, Korthuis PT, Epstein RM, Sharp V, Ratanawongsa N, Cohn J, Eggly S, Sankar A, Moore RD, Saha S. A multicenter study of physician mindfulness and health care quality. Ann Fam Med 2013;11(5):421–428. PMID:24019273
74. Shanafelt TD, West CP, Sinsky C, Trockel M, Tutty M, Satele DV, Carlasare LE, Dyrbye LN. Changes in Burnout and Satisfaction With Work-Life Integration in Physicians and the General US Working Population Between 2011 and 2017. Mayo Clin Proc 2019 Sep;94(9):1681–1694. PMID:30803733
75. Lam K, Lu AD, Shi Y, Covinsky KE. Assessing Telemedicine Unreadiness Among Older Adults in the United States During the COVID-19 Pandemic. JAMA Internal Medicine 2020 Oct 1;180(10):1389–1391. doi: 10.1001/jamainternmed.2020.2671
76. Cypress BS. Rigor or Reliability and Validity in Qualitative Research: Perspectives, Strategies, Reconceptualization, and Recommendations. Dimens Crit Care Nurs 2017;36(4):253–263. PMID:28570380
77. Bombard Y, Baker GR, Orlando E, Fancott C, Bhatia P, Casalino S, Onate K, Denis J-L, Pomey M-P. Engaging patients to improve quality of care: a systematic review. Implement Sci 2018 Jul 26;13(1):98. PMID:30045735
78. Nouri S, Khoong EC, Lyles CR, Karliner L. Addressing Equity in Telemedicine for Chronic Disease Management During the Covid-19 Pandemic. Catalyst non-issue content Massachusetts Medical Society; 2020 May 4;1(3). doi: 10.1056/CAT.20.0123