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Racial Disparities in Doctor-Patient Communication: Examining Doctors' Encounters with Black and White Patients

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Abstract
Healthcare disparities persist in the USA, with Black patients often receiving lower-quality care. Effective doctor-patient communication is crucial for influencing satisfaction, adherence to treatment, and overall health outcomes. This study examined racial disparities in doctor-patient communication, focusing on encounters with Black and White patients recently diagnosed with myelodysplastic neoplasm (MDS). Thirty-seven oncologists participated in simulated encounters with trained actors portraying either Black or White patients. Using an innovative approach combining the comparison of communication characteristics, thematic content, and linguistic analyses, we observed significant disparities in time allocation, linguistic complexity, and relation-building efforts. Encounters with Black patients were notably shorter, with doctors using fewer words per sentence, asking fewer questions, and employing less inclusive and optimistic language. Doctors also had less thorough discussions about transplant options and used fewer words communicating authenticity when talking with Black patients. The post-encounter surveys revealed that doctors were not aware of their shortcomings when interacting with Black patients. The findings provide important insights for the development of training programs aimed at improving healthcare outcomes for marginalized communities and reducing racial healthcare disparities.

Keywords Doctor-patient communication · Health disparities · Race · Medical communication

Introduction

Health disparities among racial and ethnic groups in the USA remain a critical concern even amidst significant advancements in healthcare over the past decades. According to the US Agency for Health Care Research and Quality, marginalized and low-income communities continue to experience poorer health outcomes compared to their counterparts [1]. The persistent inequalities are partly due to the substandard healthcare these communities receive of which the quality of communication between doctors and patients is a crucial component [2–4]. Indeed, Penner et al. argued that the health disparities seen between Black and White patients especially in cancer are influenced by the nature of communication in medical interactions [5].

Evidence suggests that doctors talk differently to Black patients [2, 6, 7]. However, two shortcomings plague the research on racial disparities in doctor-patient communication. Many studies limit themselves to measuring patients' perceptions of their doctors after the encounter, which, while valuable, does not provide an objective assessment of the communication behaviors of doctors [8–12]. In the few studies in which the authors examined the verbal behavior of doctors by recording the interactions, the observed differences may have been due to White patients being more engaged rather than doctors being biased against Black patients. The purpose of the present paper is to fill this gap in the literature by providing an in-depth analysis of various directly observed communication features in doctor-patient encounters.

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The Importance of Doctor-Patient Communication

High-quality doctor-patient communication is essential for optimal healthcare because it significantly influences health outcomes. Effective communication fosters trust, strengthens relationships, and encourages patients to share crucial information [4, 13]. Additionally, good communication enhances adherence rates. A meta-analysis by Haskard Zolnierek and DiMatteo revealed that effective doctor communication increases treatment adherence by 19% [14]. High-quality communication is vital for patient satisfaction and superior psychosocial and medical outcomes, especially in oncology [12, 15]. It helps regulate emotions, enhance understanding, and identify patient needs [16]. Trust in healthcare professionals, which is influenced by communication quality, is also directly linked to better health outcomes [17]. Taken together, the empirical evidence demonstrates that high-quality communication can significantly improve patient health and satisfaction [4, 14, 18].

Medical communications with patients of color are typically shorter, less patient-centered, and characterized by less positive affect [19, 20]. The encounters involve fewer attempts at relation-building and less patient participation in decision-making [10, 21]. Doctors are less likely to provide detailed explanations of diagnoses to Black patients, leading to misunderstandings about their health condition and the severity of their situation [22]. Additionally, communication about available treatment options, including alternatives and newer technologies, is often lacking for Black patients [2, 9], which prevents them from making informed decisions aligned with their preferences and values. Communication difficulties between Black patients and non-Black doctors are associated with worse healthcare outcomes, hindering the doctor-patient relationship and reinforcing health disparities [2, 5].

Significant racial disparities exist in doctor-patient communication. Encounters are influenced by both the patient's race and the racial concordance between patients and doctors [2]. Approximately 80% of Black patients receive treatment from non-Black healthcare providers, with only 2.3% of oncologists in the USA identifying as Black or African American (ASCO). This racial discordance is associated with less positive, less productive, and less informative communication compared to racially concordant encounters [5].

Importance of Identifying Racial Differences in Doctor-Patient Communication

The findings described in the previous two paragraphs are all based on studies in which researchers either measured impressions of Black and White patients after the encounter or recorded the communications between doctors and patients [8–12]. Both types of studies are problematic. The post-hoc impressions of Black patients may differ from those of White patients because Black patients have different expectations from their doctors, have less trust in healthcare providers in general, or may use the rating scales differently. Siminoff and colleagues (2006) reported that the Black patients who took part in their study were less likely to have education beyond high school and to bring a companion to the visit [10]. In another study, Black patients rated their physicians' participatory decision-making style less positively than White patients, but analyses of the actual communications revealed no differences in doctors' patient-centered communication behaviors [11].

One may argue that these problems can be avoided by recording and coding actual communications of doctors with Black and White patients. However, even studies using this methodology are plagued by interpretational ambiguities because the observed differences may be due to the different speaking patterns of the patients. In one study, Black patients produced significantly fewer "active participation utterances" [9]. Other researchers found that Black patients displayed less proactive behavior, such as asking questions or volunteering information to the physician unasked [10]. One study found that Black patients received significantly less information from doctors than White patients, but this difference disappeared after adjusting for patients' participation and companions' participation [9]. In sum, the existing studies prevent us from drawing firm conclusions about the extent to which doctors are biased against patients of color or communicate with them differently.

Another problem of previous studies is that they provide little insight into the exact aspects of the doctor-patient communication that differ between Black and White patients. It is known that encounters with Black patients are characterized by less positive affect and tend to be shorter. But how exactly do these differences emerge? Is it because doctors spend more time on certain key sections of the encounter, because they use less complex language, or are less authentic during the communication? To what extent are doctors aware of the fact that they treat Black patients differently? In short, although it is well-established that doctors talk differently to Black patients than to White patients, the exact elements that contribute to these differences are less well understood.

The research reported in this paper aims to build on previous findings by providing an in-depth analysis of numerous features of communication itself rather than relying solely on general perceptions. In addition, our doctors interacted with actors who were either Black or White and who had been trained to behave in an identical manner. We thus knew that

all racial differences observed in our study would be due to doctors treating Black and White patients differently rather than differences in patient behavior.

The Features of Communication

In our study, we selected numerous features of doctor-patient communication to assess the quality of the doctor-patient communication and the doctor-patient relationship.

First, we examined the time differences in various parts of the encounter. Time allocation is a critical component of effective medical practice, where it is both a valuable and scarce resource [23]. The duration of encounters with patients has been linked to various outcomes, including the quality of doctor-patient communication [24]. By analyzing the time spent on key sections of the conversation, we aimed to determine if the observed time differences were specific to certain parts of the encounter or reflected a general pattern.

Second, we analyzed the content of the encounters to determine if doctors discuss different topics with Black patients compared to White patients. This analysis included examining discussions about the patient's values and goals, disease information, treatment options, and outcomes. Our goal was to examine content differences through a thematic analysis in order to identify potential disparities in the information conveyed, which likely impacts patient decision-making and treatment outcomes.

Third, we assessed efforts to build a relationship. We analyze the number of questions doctors ask, the use of inclusive language, and the expression of optimism. Effective communication involves building rapport and creating a sense of teamwork [2]. Engaging patients actively in their care through questions validates their concerns and empowers them in their health management [25]. Optimistic language can also reduce anxiety and foster trust, which are vital for maintaining a positive doctor-patient relationship, especially in stressful medical situations [26]. Creating a common identity is a powerful strategy for improving intergroup interactions [5, 27].

Fourth, we examined whether linguistic features differed in encounters with Black versus White patients. We extracted features with Linguistic Inquiry and Word Count (LIWC-22), a software that analyzes text to assess various psychological dimensions [28]. Given that linguistic features convey important information about the speaker [29], they can reveal how certain conversations vary based on situational contexts and interlocutors. LIWC-22 includes several dictionaries, which are grouped by psychological and linguistic categories and are each composed of several dimensions. We focused on the "summary dimensions" and the "basic dictionary dimensions" but decided to exclude the "content-analyzing dictionaries" because context-related features were already captured by our thematic content analysis (see the "Method" section for more details).

Finally, we wanted to assess doctors' post-hoc impressions of the encounter they had just had with the patient. To address this, we included a post-encounter survey in which doctors evaluated their own performance and their perception of the patient's understanding and engagement. This self-awareness is crucial for identifying areas where doctors can improve their communication practices to reduce disparities.

By examining the features described in the previous paragraphs, we aimed to identify specific elements of communication that differ between interactions with Black and White patients. We expected the findings to provide valuable insights into how racial differences manifest in doctor-patient communication.

The Present Study

We examined the communications between doctors and trained actors simulating patients with high-risk myelodysplastic neoplasm (MDS), a rare and life-threatening form of blood cancer. The case was chosen to facilitate the collection of dialogue with complexity and life-and-death stakes of MDS treatment decisions, particularly the option of an allogeneic stem cell transplant, which requires careful and effective communication between doctors and patients [30, 31]. Patients diagnosed with MDS face challenging treatment decisions that involve understanding the severity of their condition, treatment options with their potentially severe toxicities, and potential outcomes.

Building on our team's previous work, the present study aimed to further elucidate the nuances of MDS patient-doctor encounters. Our earlier research examined various aspects of the interactions and treatment decisions. For instance, we investigated the communication strategies of doctors to discuss treatment options and facilitate decision-making during high-risk decision-making conversations [32] and the discussion of uncertainties in allogeneic hematopoietic cell transplantation outcomes [33]. The analyses identified five key sections of the conversations: Introductory Talk, Disease Talk, Treatment Talk, Transplant Talk, and Decision-Making Talk [32], which form the basis of our current analysis, particularly in assessing time differences in each section. Additionally, separate publications focused on discussions around graft versus host disease, a potential complication of allogeneic stem cell transplant, and donor-related concerns [34, 35].

While our previous papers focused on treatment outcomes and decision-making processes, this analysis focuses on the specific elements of communication and potential racial disparities. Our methodological approach is innovative because we used professional actors trained to represent the same character to ensure consistency in patient contributions to the communication and employed multiple coding methods,

including thematic content analysis and the LIWC-22 software. This multi-method approach allowed us to capture both the qualitative and quantitative aspects of communication. Additionally, we assessed the doctors' post-hoc perceptions of their encounters to gain a comprehensive view of the communication dynamics at play.

Method

Participants

Thirty-seven doctors ($Median_{age} = 44$; $Range_{age} = 33–73$) from across the USA participated in our study. They were oncologists specialized in cancer and blood disorders, who took care of patients with MDS and routinely performed allogeneic stem cell transplants. The majority of doctors were White ($n = 24$; 65%), followed by Asian doctors ($n = 9$; 24%), and doctors from other racial/ethnic groups ($n = 4$; 11%). None of them was Black or African American. Eligible participants were practicing oncologists who had completed fellowship training and who routinely performed allogeneic stem cell transplants. Recruitment was conducted via email and through personal networks. Each participating doctor received an honorarium of $249.

Actor Hiring and Training

We hired two professional actors, one Black and one White, with otherwise similar physical characteristics and age. Over four virtual rehearsal sessions totaling 8 h, we trained the actors to consistently portray the same patient character, ensuring that their performances were as similar as possible. Training included a blend of semi-scripted responses for expected interactions and improvisational techniques to adapt to unpredictable dialogue. Doctors were randomly assigned to interact with either the Black actor ($N = 17$) or with the White actor ($N = 20$). The doctors knew that they were talking to an actor and were asked to conduct the encounter as if they were talking to a real patient.

Reliability of Actors' Behaviors

After all encounters were completed, we conducted analyses to ensure that any differences in interaction outcomes were attributable to the actors' race and not variations in their behavior. We employed the "thin-slice method," which consists of creating and systematically coding excerpts of communications. This method has been shown to effectively convey information about affect and communication style, with judgments based on excerpts of 30 seconds or less proving to be as accurate and valid as those based on the entire interaction [36, 37].

To create the "thin slices," we randomly selected 10 encounters with the Black actor and 10 encounters with the White actor. Each encounter was divided into five segments of equal length. We then randomly selected one segment from each encounter but made sure that each of the five segments was selected an equal number of times (we selected segment #1 from two encounters, segment #2 from two encounters, and so forth). For each selected segment, we extracted the first 20 seconds where the actor talked continuously and the first 20 seconds where the actor listened continuously (40 seconds per encounter). This process was repeated for all encounters, resulting in two 7-minute compilation videos, one for the Black actor and one for the White actor, each containing ten 40-second excerpts. In the compilation videos, only the actors' faces were shown, while the doctors' voices could be heard but not seen.

Eleven blind coders, unaware of the study's objectives, viewed both videos in a randomized order. They rated the patients (actors) on various characteristics, which are described in the next sentences. A series of paired-sample *t*-tests revealed no significant differences in all characteristics but one (means and standard deviations are reported in Appendix A of the Supplemental Materials). For example, ratings for being relaxed ($t(10) = -1.15$, $p = 0.28$), cheerful ($t(10) = 1.00$, $p = 0.34$), friendly ($t(10) = 0.69$, $p = 0.51$), warm ($t(10) = 1.49$, $p = 0.17$), active ($t(10) = 1.79$, $p = 0.10$), attentive ($t(10) = 1.79$, $p = 0.10$), engaged ($t(10) = 0.56$, $p = 0.59$), annoyed ($t(10) = -0.84$, $p = 0.42$), stressed ($t(10) = 1.31$, $p = 0.22$), and nervous ($t(10) = -0.61$, $p = 0.56$) were not reliably different between the Black and White patients. Similarly, perceptions of the patient's understanding of the information ($t(10) = 1.75$, $p = 0.11$), trust in the doctor ($t(10) = 1.15$, $p = 0.28$), and intelligence ($t(10) = 1.31$, $p = 0.22$) were not different between the Black and White patients. However, there was a significant difference in the perception of the patient's responsibility ($t(10) = 3.73$, $p < 0.01$), with the White patient being rated higher. We do not know if this last finding is due to a false positive, to actors behaving differently, or to raters being prejudiced against Black patients.

We also counted the number of questions that actors asked during the encounter. Results show no significant difference between the Black actor ($M = 7.78$; $SD = 2.29$) and the White actor ($M = 7.21$; $SD = 2.46$), $t(35) = 0.73$, $p = 0.47$. Overall, the findings suggest that the two actors behaved in a nearly identical manner.

Procedure

The University of Wisconsin Minimal Risk Research Institutional Review Board approved the study protocol. The encounters, conducted between February 2022 and March 2023, were held virtually to accommodate safety concerns

due to the COVID-19 pandemic and to facilitate nationwide participation. We contacted doctors and told them that the study was about the conversation patterns related to the diagnosis and treatment of MDS in different kinds of patients. Before each encounter, oncologists were provided with a detailed patient profile of a 67-year-old man referred for a specialty hematology consultation after diagnosis of high-risk MDS by bone marrow biopsy. This patient profile described manageable comorbidities, including non-insulin-dependent diabetes, hypertension, and a historical peptic ulcer. The patient scenario was designed to focus the communication on treatment options and decision-making processes. Each encounter occurred via a secure videoconferencing platform, lasted up to one hour, and was video recorded for analysis. Following each session, the oncologists were asked to complete a survey assessing their experience with and perception of the patient.

Measures

General Characteristics

We measured the time spent (in min) on the total encounter and on each of the encounter's five key sections: Introductory Talk, Disease Talk, Treatment Talk, Transplant Talk, and Decision-Making Talk (which correspond to the sections developed by Rodenbach and collaborators) [32]. Additionally, we counted the number of words per sentence and the number of questions doctors asked during encounters.

We also assessed how optimistic and inclusive the doctors were. To measure optimism, we counted the number of the following words said in the entire encounter: "optimistic," "optimism," "hope," "hopefully," "improve," "positive," and "good news" [38]. The number of instances of "we," "us", and "our" was our indicator of inclusion [5].

Thematic Coding

We transcribed the encounters and conducted a thematic content analysis of the transcripts [39]. Our coding scheme was adapted from a prior content analysis focusing on key sections of oncologist conversations [32] and tailored to our research objectives. We created 11 categories: Disease 101; Basic Treatment Information; Best Supportive Care; Clinical Trial; Transplant 101; Transplant Outcomes; Decision Making; Caregiver & Social Support; Empathetic Responses & Trust-Building; Values, Goals, & Quality of Life; and Race Talk (see Appendix B of Supplemental Materials for the full coding scheme).

We analyzed the content of the complete transcripts of all 37 encounters. For each transcript, we first removed the verbalizations by the actor and then divided the doctor's verbalizations into sentences. We then coded each sentence on whether yes or no it made reference to each of the 11 categories mentioned above. Note that a single sentence could refer to more than one category. Two independent raters, who were provided with the detailed coding scheme, coded all 37 transcripts. The inter-coder reliability was 87%, indicating a high level of agreement between the coders. The analyses reported below are based on the raw numbers of sentences per category, averaged across the two coders.

Linguistic Dimensions

As mentioned in the "Introduction" section, we analyzed the linguistic features of doctors' communication using LIWC-22, a software that calculates the percentage of words in a text that fall into predefined linguistic dimensions. For example, if a doctor used 40 affect words out of 1000 words uttered during the encounter, the affect word score would be 4%. As far as we know, very little research has analyzed the linguistic features of doctors' communication in an encounter with a patient. We focused on the seven main dimensions of the software's dictionaries. Three of them are considered "summary dimensions": *Analytical Thinking*, *Clout*, and *Authenticity*. The remaining four dimensions are part of the "basic dictionary": *Affect*, *Linguistic*, *Cognitive Processes*, and *Social Processes*.

We present each dimension here, explaining what a high score indicates for doctors within the context of our study. *Analytical Thinking* refers to the use of formal and structured language (e.g., "because," "reason," "think," and "know"). A high analytical thinking score indicates that the doctor's language is systematic and clear, which is generally positive. *Clout* reflects the language of leadership, status, and confidence (e.g., "always," "clearly," "certainly," and "definitely"). A high clout score suggests that the doctor speaks with authority and assurance. *Authenticity* measures the degree to which language appears honest and personal (e.g., "I," "me," "genuine," and "real"). A high authenticity score indicates honest and more genuine conversations. *Affect* captures the use of emotional language that conveys feelings and emotions (e.g., "happy," "cried," "angry," and "excited"). A high affect score indicates that the doctor's language is rich in emotional content. *Linguistic* includes basic linguistic elements such as the use of pronouns, articles, and other parts of speech (e.g., pronouns like "I," "you," "he," and "she"; articles like "a," "an," and "the"; conjunctions like "and," "but," and "or"). A high score often reflects linguistic complexity which is generally positive as it suggests detailed and nuanced communication. *Cognitive Processes* reflect the degree of cognitive engagement, such as using words related to thinking, knowing, reasoning, and planning (e.g., "cause," "know," "ought," and "think"). A high cognition score indicates higher cognitive processing, which is generally positive as it suggests more analytical and thoughtful

communication. *Social Processes* captures verbal references to social interactions and relationships (e.g., "talk," "share," "friend," and "family"). A high social score indicates that the doctor frequently discusses social connections and closeness, which is positive as it helps build rapport and trust with patients.

Post-encounter Survey

Participating doctors completed a survey that included various scales related to their perception of the patient and the encounter that just occurred (see Appendix C of the Supplemental Materials for a complete list of all survey items).

Nine items assessed the doctors' evaluation of their own behavior during the encounter (e.g., "To what extent did you listen to what your patient had to say?"). The items were adapted from the patient-centeredness scale developed by Ryan and collaborators [40]. Participants provided their answers on a 4-point Likert scale with appropriate labels for each of the response options (e.g., not at all, a little, mostly, completely). Given the high average intercorrelation between the items ($\alpha = 0.78$), we combined them into a single score called "self-evaluation."

We used a 13-item scale to assess the doctors' perception of the patient [41] (sample item "After talking with this patient, I feel sure he will follow my recommendations"). Participants responded on a 5-point Likert scale with endpoints labeled "Strongly Disagree" and "Strongly Agree." We reverse-coded the appropriate items and formed an overall patient perception score ($\alpha = 0.84$). We also conducted an exploratory factor analysis with principal axis factoring as the extraction method and an oblimin rotation. Two of the items did not load on any of the factors and turned out to be virtually uncorrelated with the other items and with each other. A factor analysis with the remaining 11 items yielded a three-factor solution with eigenvalues of 4.50, 1.42, and 1.28, explaining 55% of the total variance. We averaged the items that loaded highly on each of the factors, which yielded three sub-scores, doctors' perceptions of the patient's motivation (4 items, $\alpha = 0.87$, sample item "This patient seems very motivated to go through the necessary treatment"), understanding (3 items, $\alpha = 0.78$, sample item "This patient comes across as highly intelligent"), and trust (4 items, $\alpha = 0.75$, sample item "This patient trusts me well").

The last construct we measured in the post-encounter survey was the doctors' perception of having worked with the patient as a team. We used three items ($\alpha = 0.56$; sample item "I felt like the patient and I were members of the same team trying to solve his medical problem") with 5-point response scales, which we combined into a "Worked as a Team" score.

Results

The means and standard deviations of all outcome variables, broken down by patient race, as well as the results of independent *t*-tests examining condition differences, can be found in Table 1. Given the small sample size, we adjusted our alpha level and commented below on all findings with *p*-values smaller than 0.10. We also report effect sizes to show that many of the observed racial differences are quite large.

Our time analyses revealed that doctors' encounters with the Black patient-actor lasted on average 14 minutes less than the encounters with the White patient-actor. The time difference was not due to doctors spending more time on a particular part of the conversation: every single section—Introduction, Disease, Treatment, Transplant, Decision Making—of the discussion was about a third of the time shorter when the patient was Black rather than White.

Doctors spoke, on average, 16.90 words per sentence. Considering that the average sentence length in written English is 14–20 words but less in face-to-face conversations [42], doctors were somewhat above the optimal level of complexity. However, they used fewer words per sentence with the Black patient-actor than with the White patient-actor.

The doctors asked many questions, 31.95 on average, which is good because it builds relationships and allows the doctors to verify if the patient has understood their explanations. However, they did so much less with the Black patient-actor, who, on average, was asked 13 fewer questions than the White patient-actor.

The doctors in our study used fewer optimistic expressions and less inclusive language with the Black patient, a finding that we will come back to in the "Discussion" section.

The results from the thematic coding analysis aligned with those from the time analyses reported above. Except for the topics that were rarely brought up (e.g., Best Supportive Care; Clinical Trial; Values, Goals, & Quality of Life), doctors discussed most topics less with the Black patient-actor than with the White patient-actor. They provided less information about MDS (Disease Talk 101) and treatment options (Basic Treatment Info), discussed allogeneic stem cell transplant (Transplant 101) and possible outcomes (Transplant Outcomes) in less detail, and talked less about patients' caregivers and social support when the patient was Black. Doctors also engaged less in joint decision-making with the Black patient-actor (14.71 vs. 18.90 sentences), but this difference did not reach the conventional level of statistical significance. It was interesting to observe that doctors did not discuss race-related issues more with the Black patient-actor (Race Talk). The means

Table 1 Summary results for the Black and White patient on all the studied communication features

	Black patient		White patient		*t*	η^2
	Mean	SD	Mean	SD		
General characteristics						
Time total (min)	33.79	9.68	48.45	9.01	4.77***	0.39
Time Introductory Talk	0.94	0.90	2.01	1.53	2.05**	0.15
Time Disease Talk	3.96	1.67	6.52	2.71	2.76**	0.24
Time Treatment Talk	4.45	2.85	6.85	3.53	1.78*	0.12
Time Transplant Talk	11.81	4.84	22.53	8.43	3.77***	0.37
Time Decision-Making Talk	3.26	1.59	4.16	2.48	1.04	0.05
Words per sentence	15.76	2.10	17.87	2.31	2.89***	0.19
Number of questions	24.82	13.35	38.00	21.63	2.18**	0.12
Optimism	7.29	5.45	11.65	6.84	2.11**	0.11
Inclusion	111.41	37.85	142.01	62.17	1.77*	0.09
Thematic coding						
Disease 101	23.76	15.17	43.25	23.79	2.91***	0.19
Basic Treatment Info	24.76	14.54	34.25	19.28	1.67	0.07
Best Supportive Care	2.29	5.49	0.35	1.57	−1.52	0.06
Clinical Trial	2.65	4.11	0.80	1.51	−1.87*	0.09
Transplant 101	39.00	23.25	66.45	45.39	2.25**	0.13
Transplant Outcomes	43.00	39.34	89.00	53.66	2.93***	0.20
Decision Making	14.71	10.88	18.90	11.62	1.13	0.03
Caregiver & Social Support	3.76	2.49	7.20	5.70	2.30**	0.13
Empathetic Responses & Trust Building	7.24	4.38	6.75	5.36	−0.29	0.00
Values, Goals, & Quality of Life	2.47	2.85	2.55	2.11	0.10	0.00
Race Talk	0.94	1.52	1.00	1.38	0.12	0.00
Linguistic dimensions						
Analytic thinking	24.55	11.40	24.04	9.02	−0.15	0.00
Clout	88.73	6.98	87.95	7.63	−0.32	0.00
Authenticity	34.80	8.56	43.46	9.79	2.84***	0.17
Affect	2.50	0.54	2.49	0.45	−0.09	0.00
Linguistic	73.55	2.59	75.95	2.86	2.67**	0.17
Cognitive processes	14.85	1.54	16.43	1.86	2.78**	0.18
Social processes	12.77	1.29	12.57	1.44	−0.45	0.00
Post-encounter survey						
Self-evaluation	2.90	0.32	3.07	0.41	1.40	0.06
Patient perception overall	3.61	0.41	3.86	0.40	1.81*	0.09
Patient perception—motivation	3.99	0.50	4.24	0.55	1.45	0.06
Patient perception—understanding	3.45	0.62	3.85	0.45	2.25**	0.13
Patient perception—trust	3.37	0.52	3.48	0.44	0.68	0.01
Worked as a team	3.59	0.42	3.67	0.43	0.56	0.00

*$p < 0.10$. **$p < 0.05$. ***$p < 0.01$

in Table 1 show that doctors rarely talked about race and ethnicity with both the Black and White patient-actors.

Our analyses of the LIWC-22 dimensions showed significant racial differences with regard to *Authenticity*, *Linguistic*, and *Cognitive Processes*. Doctors used a smaller percentage of words reflecting authenticity with the Black patient-actor than with the White patient-actor, a finding that aligned with other indicators of relation-building and comfort in talking to the patient. The differences in *Linguistic* and *Cognitive Processes* showed that doctors talked to the Black patient-actor in a less intellectual, complex manner, possibly in an attempt to increase comprehension of the Black patient-actor who was perceived as less able to understand medical explanations (see below). It is interesting to observe that there were no differences in *Analytic Thinking*, *Clout*, *Affect*, and *Social Processes*, suggesting that there were no differences in the overall positivity, the emotional content, or the formal

and hierarchical language of the communication with all doctors.

The post-encounter survey revealed that doctors' self-evaluations did not depend on the race of the patient they talked to. Doctors who talked to the Black patient-actor had a less positive view of the patient. They expressed doubts about the Black patient's ability to understand the explanations that they gave him. Interestingly, doctors felt that the Black patient-actor was just as motivated and likely to follow through with the recommendations ("Motivation") than the White patient-actor. They also felt that the Black patient-actor trusted them and the treatment offered as much as the White patient ("Trust"), which is somewhat at odds with numerous studies showing that Black patients trust their healthcare providers less than White patients [6, 43]. Doctors did not feel that they worked more or less as a team with the Black patient than with the White patient.

Discussion

The study is groundbreaking due to its in-depth analysis of different communication features in doctors' discussions with Black and White patients, while also assessing doctors' views of the encounters and the patients. In this section, we will discuss our results, their implications, limitations, and conclusions.

Summary of the Results

Our study revealed significant time differences in doctor-patient interactions, with doctors spending less time with the Black patient-actor than with the White patient-actor. The time difference was consistent across all sections of the conversation, indicating a systemic issue rather than a specific topic being discussed more extensively with White patients. The consistent time disparities suggest that doctors may prioritize their time differently based on the patient's race, potentially due to intergroup anxiety or perceived differences in patient engagement or understanding. The unequal time allocation can limit the depth of information exchanged and reduce the quality of the doctor-patient relationship, ultimately impacting the health outcomes of Black patients [24, 44]. The thematic coding largely replicated the time analyses, showing that doctors discussed most topics less with Black patients than with White patients.

It is noteworthy that discussions about Caregiver & Social Support were shorter with the Black patient-actor, suggesting a potential gap in addressing the support system that can be crucial for patient care and recovery. The difference possibly reflects a lack of doctors' engagement in understanding and leveraging the social networks that are vital for Black patients' health management. On a similar note, the lack of differences in Race Talk was surprising, because one might have expected doctors to explicitly acknowledge and discuss the patient's race, especially since there are fewer donors for Black people than for White people in the donor registry [35, 45]. Doctors' hesitancy to discuss race could stem from a fear of being perceived as offensive or culturally insensitive [27, 46]. However, avoiding Race Talk might result in missed opportunities to address important cultural and social factors that influence the patient's health and treatment preferences. The finding highlights the need for communication training that helps doctors have a more open and inclusive dialogue that can better address the needs of Black patients.

In terms of linguistic complexity and cognitive engagement, doctors used fewer words per sentence and less complex language with Black patients, potentially due to a perception that Black patients are less intelligent or have more difficulties understanding medical explanations. The finding aligns with the post-encounter survey, where doctors reported perceiving Black patients as less likely to understand the explanations provided. Simplifying language can be beneficial for clarity; however, it can also reflect underlying assumptions about patient comprehension, engagement, and intelligence [47, 48]. The bias in patient perception is unambiguous in our study since both our patients were 67-year-old retired, married high school math teachers with three adult children; i.e., they had the same character and identical sociodemographic profiles, values, and goals.

Doctors who talked to the Black patient-actor showed lower levels of authenticity, were less optimistic, used less inclusive language, and asked fewer questions. These differences can undermine the collaborative nature of the doctor-patient relationship and hinder the shared decision-making process. Optimism, which is crucial for patient morale and emotional well-being during high-risk medical encounters [49, 50], was notably lower in interactions with Black patients. The reduced use of optimistic language and inclusive pronouns can make patients feel less supported and less included in the treatment decision. However, there were no significant differences among the content categories "Empathetic Responses & Trust-Building" and "Values, Goals, & Quality of Life," indicating that the disparity does not lie in the topics discussed but in how they were discussed. Taken together, the results suggest that specific communication training for doctors should focus more on features that enhance trust-building and partnership rather than on the content of the discussions.

Finally, the post-encounter survey revealed that doctors had little insight into the quality of their communication with the Black and White patients. Despite striking differences (see the findings reviewed in the previous paragraphs), the doctors who had talked to the Black patient evaluated themselves just as positively as did the doctors who had just talked to the White patient. Somewhat surprisingly,

doctors who talked with the Black patient evaluated the patient less positively. Note that this difference seems to be entirely driven by doctors perceiving the Black patient as less intelligent and less able to understand the explanations. Remember that the 11 blind coders who rated the actors' behaviors judged the Black actor to be just as engaged, attentive, and intelligent as the White actor. The findings suggest that doctors may not fully grasp how their communication style impacts the development of a partnership and shared decision-making process with Black patients.

Interventions and Communication Training

Engaging in complex conversations with patients requires considerable skill, and many doctors are dedicated to improving their communication strategies. Our findings highlight the complexity and variation of communication features based on the patient's race, revealing systemic issues that demand targeted interventions. Importantly, communication skills can be effectively taught and refined, as demonstrated by various interventions and programs [51–54].

Doctors' and other healthcare professionals' communication practices are crucial and are subject to improvement through deliberate communication training. They should be trained to consciously allocate equal time to all patients, regardless of race, as time equity can help foster better doctor-patient relationships and ensure comprehensive care. We understand that in practice, it can be more complicated, depending on various variables such as the patient's personality or emotional state. We recommend that training programs include practical techniques for effectively managing time and provide frequent opportunities for patients to ask questions or express concerns. One possible technique is to provide a structured approach, akin to a checklist, to ensure consistency and thoroughness. Tools like the "serious illness conversation guide" and other pen-and-paper diagrams are excellent examples of such structured methods [54].

Doctors should consciously consider a patient's race to correct for potential discrepancies. This involves asking more questions, actively listening, and allocating more time to Black patients to counteract inherent biases and ensure they feel valued and heard. Training should also focus on educating doctors about the importance of providing detailed explanations to all patients, regardless of perceived engagement or intelligence. This approach combats assumptions about patient comprehension based on race and ensures all patients receive the information needed for informed decisions. Assessing patient understanding during encounters, as outlined in the SPIKES protocol [55], and enhancing questioning techniques are critical components of this training. Doctors should be encouraged to ask more questions and allow patients, especially those of color, to express their concerns (see the "Ask-Tell-Ask strategy" [25]). This approach validates patients' concerns, empowers them in their health management, and fosters a more engaging dialogue.

Projecting optimism while maintaining realistic expectations and inclusiveness is important for maintaining a positive doctor-patient relationship. Training programs should teach doctors how to help patients feel more supported and more included in the decision-making process. Additionally, developing strategies to enhance authenticity in doctor-patient interactions is essential. Authentic communication builds trust and fosters a sense of partnership and shared decision-making. Training should focus on helping doctors connect with their patients on a personal level, ensuring that their interactions are genuine and empathetic. Communication skill training programs targeting emotion-handling and rapport-building behaviors are promising strategies to reduce disparities in healthcare and enhance trust among ethnic minority patients [5, 47].

Our results suggest that incorporating multiple communication components in future training will significantly improve the health outcomes of patients of color. By implementing targeted training measures, healthcare providers can work toward more equitable healthcare interactions and outcomes.

Limitations

It is essential to acknowledge the limitations of our study. The relatively small sample size might have restricted our ability to detect subtle differences in communication or doctor perceptions as a function of patient race. Furthermore, the generalizability of the results may be limited to oncologists within similar practice settings and may not extend to other medical specialties or settings. Additionally, we did not assess the patient-actors' perceptions of the encounters, which would have offered valuable insights into perceived efficient communication elements. Finally, we do not know if our findings generalize to actual interactions with real patients. Although standardized actors provide a controlled and consistent framework for analyzing doctor behavior, real patients may respond differently based on personal health histories, emotional states, or social contexts. Future research should include larger and more diverse samples to validate our findings across different medical contexts and should also focus on the perception of patients regarding their encounter with doctors, examining aspects like satisfaction, trust, and treatment adherence.

Conclusion

Our study revealed critical disparities in doctor-patient communication based on race, emphasizing the urgent need for targeted interventions. Nonetheless, more research is needed

to examine the expectations and preferences of patients from diverse ethnic and racial groups regarding doctors' communication. Our research paves the way for a more equitable and just healthcare system, ensuring that all patients receive the high-quality care they deserve. Doctors, like everyone else, hold varying attitudes toward members of racial/ethnic minorities. However, doctors differ from others regarding their professional role and code of conduct [56]. By recognizing and addressing differences in doctors' verbal and nonverbal behavior toward patients of color, the medical community can take significant steps toward ensuring equitable care for all patients. The results of the present study offer actionable insights for doctors, policymakers, and educators, toward facilitating positive changes in doctor-patient communication and improving healthcare outcomes for Black patients, especially those facing high-risk health conditions.

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Author Contribution Rachel Rodenbach, Toby Campbell, Thorunn Thordardottir, and Markus Brauer contributed to the study's conception and design. All authors prepared the materials and collected the data. Cassandra Gedeon and Markus Brauer analyzed the data. Cassandra Gedeon wrote the first draft of the manuscript, and all authors commented on previous versions. All authors read and approved the final manuscript.

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Data Availability This study's de-identified dataset and analysis code are publicly available at https://osf.io/9zgd7/.

Declarations

Competing Interests The authors declare no competing interests.

Ethics Approval The study protocol was approved by the University of Wisconsin Minimal Risk Research Institutional Review Board.

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