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The impact of Black cancer patients' race-related beliefs and attitudes on racially-discordant oncology interactions: A field study

Louis A. Penner^{a,*}, Felicity W.K. Harper^a, John F. Dovidio^b, Terrance L. Albrecht^a, Lauren M. Hamel^a, Nicole Senft^a, and Susan Eggly^a

^aDepartment of Oncology, Wayne State University, Karmanos Cancer Institute, United States

^bDepartment of Psychology, Yale University, United States

Abstract

Objective—Both physician and patient race-related beliefs and attitudes are contributors to racial healthcare disparities, but only the former have received substantial research attention. Using data from a study conducted in the Midwestern US from 2012 to 2014, we investigated whether 114 Black cancer patients' existing race-related beliefs and attitudes would predict how they and 18 non-Black physicians (medical oncologists) would respond in subsequent clinical interactions.

Method—At least two days before interacting with an oncologist for initial discussions of treatment options, patients completed measures of perceived past discrimination, general mistrust of physicians, and suspicion of healthcare systems; interactions were video-recorded. Measures from each interaction included patients' verbal behavior (e.g., level of verbal activity), patients' evaluations of physicians (e.g., trustworthiness), patients' perceptions of recommended treatments (e.g., confidence in treatment), physicians' evaluations of patient personal attributes (e.g., intelligence) and physicians' expectations for patient treatment success (e.g., adherence).

Results—As predicted, patients' race-related beliefs and attitudes differed in their associations with patient and physician responses to the interactions. Higher levels of perceived past discrimination predicted more patient verbal activity. Higher levels of mistrust also predicted less patient positive affect and more negative evaluations of physicians. Higher levels of suspicion predicted more negative evaluations of physicians and recommended treatments. Stronger patient race-related attitudes were directly or indirectly associated with lower physician perceptions of patient attributes and treatment expectations.

Conclusion—Results provide new evidence for the role of Black patients' race-related beliefs and attitudes in racial healthcare disparities and suggest the need to measure multiple beliefs and attitudes to identify these effects.

Keywords

Race-related beliefs and attitudes; Racial healthcare disparities; Racially discordant clinical interactions

*Corresponding author. Department of Oncology, Wayne State University, Karmanos Cancer Institute, 4100 John R., MM03CB, Detroit, MI, 48201, United States. pennerl@karmanos.org (L.A. Penner).

1. Introduction

In their seminal report, “Unequal Treatment” (Smedley et al., 2003), the Institute of Medicine panel proposed that race-related attitudes of both healthcare providers (e.g., racial bias) and patients (e.g., mistrust) play an important role in persistent racial healthcare disparities (Agency for Healthcare Research and Quality, 2016). This report stimulated new research investigating the influence of physicians’ race-related attitudes in racially discordant clinical interactions (i.e., patient and physician are of different races) (see Hall et al., 2015). Substantial research evidence shows that the race-related beliefs and attitudes generally brought by Blacks to dyadic interracial interactions affect both participants in these exchanges and interaction outcomes (Shelton and Richeson, 2015). Despite this evidence, few studies have examined the effects of Black patients’ stable, pre-interaction race-related beliefs and attitudes on racially discordant clinical interactions, which can ultimately affect the quality of medical care they experience. Thus, the goal of the present research was to extend limited prior work on the impact of Black patients’ race-related beliefs and attitudes *before* they enter racially discordant clinical interactions. We did so by examining their effects on both Black patients and non-Black physicians *during* and *after* the interactions.

We studied these relationships in the context of oncology interactions because of well-documented racial disparities in cancer treatment (e.g., Tehranifar et al., 2009) and the acknowledged need to examine racially discordant interactions to better understand such disparities (e.g., Shen et al., 2017; van Ryn et al., 2011). In general, communication and information exchange between physicians and patients in these interactions are poorer than in racially concordant interactions (Eggly et al., 2017). These dynamics of racially discordant medical interactions have significant practical implications for Black cancer patients: Over 80% of Black patients’ interactions with oncologists are racially discordant (Hamel et al., 2015).

1.1. Race-related beliefs and attitudes

Much of the prior literature on Black patients’ reactions to racially discordant clinical interactions views these patients as being largely driven by physicians’ attitudes and behaviors (the more “powerful actor”) (Smedley et al., 2003). We do not question the importance of physicians in these interactions, but a core assumption of the present work is that Black patients’ race-related beliefs and attitudes also play an important role in affecting both parties in physician-patient interactions.

The specific beliefs and attitudes chosen for this study were perceived past discrimination, mistrust of physicians, and the suspicion of Black patients that they will be mistreated by their healthcare systems. These variables were chosen based on research documenting potentially important feelings of Black patients in racially discordant clinical interactions (Penner et al., 2013a; Penner et al., 2009; Penner et al., 2016a). Although these beliefs and attitudes are likely related, a central premise of this study is that they have distinctive elements and thus, may differ in their effects in racially discordant clinical interactions.

Perceived past discrimination involves Black patients' previous personal experiences in which they believe other people intentionally treated them unfairly. Discrimination does not, however, directly involve negative evaluations of any group. Black patients' mistrust of physicians is also based on past experiences, but it has a clear negative evaluative component missing in discrimination — the patients' feelings about physicians. Suspicion also has a negative evaluative component, but the focus on healthcare systems differs from the focus for mistrust. Further, the measurement of suspicion is less concerned with respondents' personal experiences and more with their beliefs about the kind of healthcare members of their group may receive (Thompson et al., 2004). Also, other research finds that suspicion involves less certainty than mistrust (Sinaceur, 2010), so suspicion may result in less certainty about what will transpire in a clinical interaction than either perceived discrimination or mistrust.

Empirically, a study (Penner et al., 2016a) using the same Black cancer patients as this study found that perceived past discrimination, mistrust of physicians, and suspicion of healthcare were positively but only weakly to moderately correlated (r s 0.08 to 0.35). Penner et al. also showed different patterns of associations with patients' demographic characteristics (e.g., education) and attitudes related to their healthcare. For example, suspicion was significantly *negatively* correlated with patients' belief about the importance of physicians in the outcome of their cancer. Mistrust was unrelated to this belief, and discrimination was *positively* correlated with it.

Thus, based on the literature reviewed so far, there are practical, theoretical, and empirical reasons to study the individual and collective influence of Black patients' perceived discrimination, mistrust, and suspicion on clinical interactions. The present research investigated effects of these beliefs and attitudes measured prior to a racially discordant clinical interaction on behaviors during these interactions and medically-relevant evaluations measured after the interactions. Interaction measures assessed the patients' affect during the encounter (the emotion reflected in the words they used) and their compensatory responses to bias (verbal activity, both directly and in relation to physicians' verbal activity). The post-interaction responses were patients' evaluations of physicians and of the recommended treatment. In addition to the effects of these beliefs and attitudes on patients, we also investigated how they predicted physicians' impressions of patients and treatment expectations for them.

1.2. Present study hypotheses

The present research extended prior research on Black patients' beliefs and attitudes by investigating how they influenced patients and physicians in racially discordant clinical interactions. The primary question involved how each of these beliefs and attitudes would predict: (a) patient verbal behaviors during the interactions and their subsequent evaluations of their physicians and their treatment recommendations and (b) physician's perceptions of patients' personal attributes and their expectations about patient responses to treatments. Predictions for the direct and/or indirect effects of each of the beliefs and attitudes for patients and for physicians are presented below.

1.2.1. Patients

Emotion-Related Words: Use of emotion-related words reflects people's feelings during an interaction (Pennebaker, 2016). Consequently, we hypothesized that, because mistrust of physicians directly involves negative affect associated with physicians (Dugan et al., 2005), Black patients with higher pre-interaction levels of mistrust would use more negative and/or fewer positive-emotion words. Perceived past discrimination, which might be associated with anticipation of bias in the medical interaction (Penner et al., 2009), and healthcare suspicion, which involves scrutiny for signs of bias, might predict word use as well. However, we considered these effects unlikely and did not offer a firm prediction for either discrimination or suspicion.

Verbal activity: Our prior research suggests that Black patients' level of verbal activity is also affected by their race-related beliefs and attitudes. Specifically, in another medical setting (primary care interactions), we found that Black patients who reported experiencing greater general discrimination in the past engaged in more verbal activity during interactions (Hagiwara et al., 2013). We expected to replicate this effect in oncology interactions. In addition, because mistrust of physicians is related conceptually to anticipated bias, we also hypothesized that Black patients who have greater mistrust of physicians would engage in more verbal activity during their interactions with non-Black physicians. Because healthcare suspicion is more related to efforts determining whether bias is occurring than to firm anticipation of bias in the specific medical interaction, we did not predict an association between patients' level of suspicion and their verbal activity.

Evaluations of Physicians: Patients evaluated physicians in the present study on (1) patient-centeredness and (2) trustworthiness. All three beliefs and attitudes have been found to predict less favorable patient perceptions of their physician because they relate to anticipation of bias (mistrust of physicians and past discrimination) and critical scrutiny (healthcare suspicion) (e.g., Hagiwara et al., 2013; Penner et al., 2009; Sheppard et al., 2016). We predicted that we would replicate these effects for mistrust and suspicion in oncology interactions on patient perceptions of the physician's patient-centeredness during the interaction and trust for the physician. As experiences of discrimination correlate with mistrust of physicians (Penner et al., 2016a), we investigated whether more perceived past discrimination would *indirectly* predict more negative evaluations of the physician, mediated through mistrust.

Evaluations of Recommended Treatments: We measured two facets of patients' evaluations of treatment recommendations: (a) perceived difficulty in completing the cancer treatments, and (b) confidence in the effectiveness of the treatments. To the extent that negative general evaluations not only affect evaluations of physicians but also adversely influence evaluations of the physician's recommendations, we also expected that higher levels of mistrust and healthcare suspicion would be associated with greater expected difficulty completing the treatment, whereas suspicion, which involves scrutiny and skepticism, would be likely to most strongly predict confidence in the prescribed treatment. Again, we expected any effects for perceived past discrimination would be indirect, mediated through mistrust.

1.2.2. Physicians

Perceptions of Patients' Personal Attributes: We did not predict any *direct* associations between the patients' beliefs and attitudes and physicians' perceptions of them because there is no obvious way through which physicians can discern the patients' internally-held beliefs and attitudes. We did, however, expect an indirect association mediated through the effects of patients' verbal behavior.

Regarding use of emotion-related words, based on prior research on the impact of the affect a person displays in social interactions (Gable et al., 2004), we predicted that usage of positive-emotion words and/or usage of negative-emotion words would be associated with physician perceptions of patients' personal attributes.

We also expected that level of verbal activity would directly affect physician perceptions. We did not, however, predict a specific direction for this relationship. This is because the research literature supports both a prediction that greater patient verbal activity could result in more *positive* physician perceptions of patients' personal attributes (Epstein and Street, 2011) and a prediction that greater verbal activity could result in more *negative* physician perceptions (Hagiwara et al., 2013).

Treatment Expectations: We did not expect any *direct* effects of patients' beliefs and attitudes on physicians' treatment expectations. Rather, based on prior research about physicians' perceptions of Black patients' treatment-related personal attributes and their treatment decisions (e.g., Calabrese et al., 2014; Sabin and Greenwald, 2012; van Ryn et al., 2006), we predicted that any relationships between stronger patient beliefs and attitudes (i.e., more perceived discrimination, mistrust, and suspicion) and lower physicians' treatment expectations would be indirect, mediated through their perceptions of patients' attributes.

2. Methods

2.1. Data collection

The study used de-identified data from a larger randomized control trial testing an intervention to improve communication between Black cancer patients and non-Black oncologists (Eggly et al., 2017). It was conducted between April 2012 and December 2014 in outpatient clinics of two cancer hospitals. The study design involved baseline assessments, random assignment of patients to clinical interactions in one of three experimental conditions within two weeks prior to a clinical interaction, video recording of interactions, and post-interaction questionnaires. Institutional Review Boards at the authors' university and both hospitals approved all procedures.

Ninety-nine of 114 interactions between patients and physicians were video recorded using unobtrusive, remotely-controlled video cameras. (Fifteen interactions were not recorded because of equipment problems.) Trained observers subsequently viewed the video recordings and rated various aspects of patients' and physicians' verbal behaviors. Observers were two Black and two White research assistants previously trained to code clinical interactions. All video recorded interactions were transcribed.

2.2. Study population

2.2.1. Patients—Patients were eligible if they (a) self-identified as Black, African American, or Afro-Caribbean; (b) were over the age of 30; (c) had a diagnosis of breast, colon, or lung cancer; (d) could comprehend English well enough to provide informed consent and complete questionnaires; and (e) had an appointment within the next two weeks to see a participating oncologist for an initial discussion of treatments for their cancer. They received \$60.00 when they completed the study.

Once consented, patients provided socio-demographic and personal information (e.g., gender, age, education, annual family income), answered questions about their general thoughts and feelings related to healthcare (Penner et al., 2016a) and completed measures of their race-related beliefs and attitudes. Patients were then randomly assigned to one of three study arms: (a) control (usual care); (b) receiving a “question prompt list” with questions patients might ask their oncologist about cancer and cancer treatments; or (c) receiving the question prompt list and meeting with a “coach” to review the questions. Treatment arm was not a predictor in the present study, but was controlled in the tests of study hypotheses.

Immediately after interactions, patients provided evaluations of their physician and of the recommended treatment. One week later, patients answered questions about their trust in their physician during a telephone interview. These patients did not differ from patients enrolled in the larger study with regard to personal characteristics or beliefs and attitudes.

2.2.2. Physicians—Physician participants were 18 medical oncologists who had a clinical interaction with study patients and provided valid responses to questions about perceptions of their patients and treatment expectations. Physicians were eligible to participate if they were non-Black. They received \$50.00 gift cards for participation. Once consented, physicians provided socio-demographic and professional information (e.g., age, gender, ethnicity, years in practice) and completed a measure of implicit racial bias, the Implicit Association Test (Greenwald et al., 2009). Immediately after their interaction with a study patient, physicians rated the patient on a list of personal attributes and provided their treatment expectations for them.

2.3. Measures

2.3.1. Patients

Race-related Beliefs and Attitudes: The race-related beliefs and attitudes were assessed during the baseline, which was 2–14 days before the clinical interactions. *Perceived Past General Discrimination* was assessed with a modified version of the Brown (2001) perceived discrimination measure. Patients indicated if they had ever experienced unfair treatment in each of five domains—employment (2 items), law enforcement (1 item), education (1 item), housing (2 items), and clinical care (1 item). The measure has a yes/no response scale. Total score was the number of yes responses, which represented patient reported discrimination. The odd-even correlation (i.e., split-half reliability for the scale) was 0.65. However, the total discrimination score was not used in all analyses (see Data Preparation and Analysis section 2.4.1, *Data Preparation* for an explanation of how the scale was scored.)

General Mistrust of Physicians was assessed with the five-item *Trust in the Medical Profession Scale* (Dugan et al., 2005). This scale assesses the extent to which patients believe that physicians in general care about them and are trustworthy. It predicts patient satisfaction and adherence (Penner et al., 2013b). Patients responded to each item on a five-point (1 = Strongly Disagree to 5 = Strongly Agree) scale. The physician trust scale is normally scored in a positive direction; however, in the interest of clarity in the analyses, we reversed scored the items. Therefore, higher scores on the scale represent greater *physician mistrust* rather than trust. The mean item score (reversed scored) was 2.51 ($SD = 0.78$; $\alpha = 0.85$).

Suspicion was measured with five items from the six-item Suspicion subscale of the *Group-Based Medical Mistrust Scale* (Thompson et al., 2004). (One item was inadvertently omitted.) Higher scores on this subscale reflect greater concerns that Black patients will be mistreated by the healthcare system. This subscale correlates negatively with mammogram frequency and attitudes toward prostate screening (Shelton et al., 2010; Thompson et al., 2004). Patients responded to each item on a five-point (1 = Strongly Disagree to 5 = Strongly Agree) scale. Mean item score was 1.82 ($SD = 0.76$; $\alpha = 0.87$).

Use of Emotion-Related Words: Linguistic Inquiry and Word Count (LIWC) word count software (Pennebaker et al., 2015) was applied to the transcripts to compute the percentages of total words spoken by patients that were categorized as being associated with *positive - emotions* (e.g., happy, joy) and with *negative- emotions* (e.g., nervous, afraid). On average, 7.89% ($SD = 5.38\%$) of patients' words were categorized as being associated with positive emotions, and 0.88% ($SD = 0.49$) of words were categorized as being associated with negative emotions.

Verbal Activity: Patients' level of verbal activity was assessed with four measures, obtained from observers' ratings of video recordings of the interactions and analyses of the transcripts. The first measure was the extent to which patients engaged in each of seven behaviors associated with active participation in clinical interactions (e.g., asking questions). Observers used a five-point scale (1 = Strongly Disagree to 5 = Strongly Agree). Mean rating for these items was 3.45 ($SD = 0.78$). Inter-observer intra-class correlation (ICC) for ratings of patients' behaviors was 0.89. The second measure was observers' counts of the frequency of specific active participation communication behaviors (e.g., stating concerns). The mean number of behaviors was 16.40 ($SD = 13.15$; inter-observer $ICC = 0.84$).

The other two measures of patient verbal activity were (a) *word-count* (i.e., total number of words a patient spoke during an interaction) and (b) *talk-time* (i.e., amount of time a patient spoke during an interaction). Word-count was assessed using the verbatim transcripts of all video recorded interactions, which were created using guidelines specifically developed for text analysis using LIWC software (Pennebaker et al., 2015), which provided a count of total number of patient words. Talk-time was based on observers' ratings (using Studiocode®) of the amount of time a patient spoke during the interactions. Precise agreement between observers on talk time approached 80%. There were no systematic differences between Black and White observers on any of the observational measures.

Evaluations of Physicians: There were two measures of *patients' evaluations of their physician*: the *Patient-Centered Communication Scale* (Stewart et al., 2000) and the *Abbreviated Patient Trust in Physician Scale* (Dugan et al., 2005). Immediately after the interaction, patients rated their physician's patient-centered behavior using the first scale, which contains 14 individual patient-centered behaviors (e.g., "Was concerned about me as a person"). Patients used a four-point response scale (1 = Not at all to 4 = Completely) to rate their physician. Mean item score was 3.64 ($SD = 0.36$; $\alpha = 0.84$). This scale has demonstrated reliability and predicts outcomes of clinical interactions (Stewart et al., 2000). One week after the interaction patients rated their physician on the trust scale. The scale contained five-items (e.g., "All in all, I have complete trust in this doctor"). Patients used a five-point response scale (1 = Strongly Disagree to 5 = Strongly Agree). Mean item score was 4.17 ($SD = 0.61$; $\alpha = 0.79$). This scale has been found to predict patient adherence (Penner et al., 2013b).

Evaluations of Recommended Treatments: Immediately after the interaction, patients used six-point scales to rate: (a) how sure they were that the recommended treatment by their physician was the best treatment for their cancer (1 = Extremely Unsure to 6 = Extremely Sure); and (b) how difficult they thought it would be to complete their treatment (1 = Extremely Easy to 6 = Extremely Difficult). Responses to the two items correlated 0.41. Means for the two items were 4.65 and 2.47 ($SDs = 0.67$ and 0.97 , respectively). Because they concern conceptually distinct aspects of patient treatment evaluations, items were analyzed separately.

2.3.2. Physicians

Perceptions of Patients' Personal Attributes: Immediately after the interaction, physicians used a six-point scale (1 = Strongly Disagree to 6 = Strongly Agree) to rate their patient on four personal attributes (has a healthy life style, is well educated, is intelligent, and understood treatment options). van Ryn et al. (2006) found that higher ratings on these attributes were associated with more positive physician expectations about treatment success in a study of actual physician recommendations for coronary bypass surgery, and they mediated relationships between patient race and physician treatment recommendations. The items were highly inter-correlated (mean $r = 0.55$; mean item score 3.90, $SD = 0.79$). Thus, they were combined into a single measure (see section 2.4.1 Data Preparation for details).

Treatment Expectations: Physicians used the same six-point scale to respond to three statements: (a) the patient would follow their medical advice, (b) the patient would follow the treatment regimen, and (c) the patient would tolerate the treatment regimen (Penner et al., 2016b). The items about following medical advice and treatment regimens were highly inter-correlated ($r = 0.89$). Therefore, they were averaged to create a single *anticipated adherence* measure. Mean item score was 4.42 ($SD = 0.64$). Mean score for the tolerance item was 3.93 ($SD = 0.67$). The two measures were correlated 0.34 and therefore were analyzed separately.

2.4. Data Preparation and statistical analyses

2.4.1. Data Preparation

Perceived Past Personal Discrimination: As other studies (e.g., Hagiwara et al., 2013) have found, the distribution of scores on the perceived discrimination measure had a zero-inflated Poisson distribution. That is, the distribution had an *occurrence component*—whether patients reported none or some past discrimination—and a *frequency component*—for patients who did report some discrimination, the number of domains in which they reported discrimination. Prior research found that the two components yield different correlations with measures such as the proportion of time patients talked during clinical interactions relative to their physicians, the number of chronic illnesses patients had, and patient decision-making preferences (Hagiwara et al., 2013; Penner et al., 2016a). Hence, we separately analyzed two components of perceived discrimination: *occurrence* and *frequency*. Ninety-two patients (67%) reported an occurrence of discrimination in at least one domain. The average frequency of domains in which they reported discrimination was 2.57 ($SD = 1.69$).

Physician Perceptions of Patient Personal Attributes: A factor score for the four items was generated in SPSS 24 and used in the correlations and multilevel analyses of bivariate associations. (A latent variable was created in the mediation analyses described in section 2.4.2 “Mediation Analyses.”)

Verbal Activity: The four measures of absolute patient verbal activity (rating of overall activity, frequency of specific behaviors, word count, and talk-time) were z -transformed, and when treated as scale items, α was 0.87. Thus, they were combined into a single composite activity measure.

A second activity measures was the *relative* verbal activity of patients and their physicians, which we recorded via word-count and talk-time for each physician in exactly the same manner as for patients. Then we computed patient-to-physician ratios for each measure. The mean ratios of patient to oncologist word-count and patient to oncologist talk-time were 0.32 ($SD = 0.19$) and 0.36 ($SD = 0.19$), respectively. (That is, physicians spoke more words and had greater talk times.) The two ratios were highly correlated ($r = 0.94$), so they were combined into a single measure.

The ratio measure was strongly correlated with the composite measure of verbal activity ($r = 0.60$). However, because of the conceptual difference between a measure of patients’ absolute verbal activity and patients’ relative verbal activity, they were analyzed separately.

Z-score Transformations: All patient measures (including evaluations) were z -transformed before any analyses were performed. Physician perceptions of patients’ attributes and treatment expectations were also z -transformed. This transformation was done to permit standardized estimates of the relative strength of effects across predictor and outcome variables with different units of measurement (Hunter and Hamilton, 2002).

Covariates: Zero-order correlations identified baseline and other measures in the dataset that might be associated with outcome measures. If a measure was significantly associated ($p < 0.05$) with an outcome variable, it was entered as a covariate in the relevant model along with the predictor and outcome variables. Specific covariates are identified when the results of each analysis are presented. All covariates were entered on level 1 of multi-level models unless otherwise noted. Finally, as already noted, to control for any effects of the larger study intervention, study arm was included in *all analyses* as an additional covariate.

2.4.2. Statistical analyses

Initial Correlational Analyses: The associations among each of patients' pre-interaction race-related beliefs and attitudes and (a) patient behaviors, perceptions, and expectations and (b) physician behaviors, perceptions, and expectations were initially assessed with zero-order correlation coefficients.

Multilevel Regression Analyses: The initial correlation analyses did not take into account the fact that patients were nested within oncologists and their responses were therefore not independent. Thus, we conducted separate multilevel regression analyses for each of the outcome measures, using the *lme* program in **R**. In these analyses, patient beliefs and attitudes were entered as level-1 variables nested within oncologists (level 2). Separate multilevel regressions tested the impact of each of the beliefs/attitudes on each of the outcome variables described in the methods section and section 2.4.1. Both equal and unequal variance models were tested and compared with Akaike and Bayesian fit indices. Results reported are for the best-fit model with 95% confidence intervals (CI) reported for each estimate.

Mediation Analysis: The analyses of the indirect effects were conducted with a multilevel structural equation model using Mplus (Version 8, Muthen and Muthen, 1998–2017). Physician perceptions of patient attributes was a latent variable created in these analyses. All level-1 variables were nested with physicians (level 2), with patient education, patient income and study arm as the control variables. Mplus provided parameter estimates and 95% credibility intervals (CrI) (Geldhof et al., 2014) for these estimates.

For all planned analyses, the alpha for significance was <0.05 ; assuming a medium effect size ($f^2 = 0.15$), the regression analyses of bivariate associations had about 0.85 power to detect significant effects.

3. Results

3.1. Patient and physician characteristics

Table 1 presents patients' and physicians' personal, professional and clinical information.

3.2. Tests of hypotheses

Table 2 presents zero-order correlations among all study variables. The pattern of significant zero-order correlations were generally consistent with predictions made about direct

bivariate associations. Table 3 presents the results of multilevel regressions relevant to the study hypotheses. Specific findings for the regressions are discussed in the next sections.

3.2.1. Patients

Use of Emotion-related Words: Physician use of positive-emotion words (calculated in exactly the same manner as patient use) was associated with patient use of these words ($p = 0.02$). Therefore, physician use of positive-emotion words was entered as a covariate in analyses of patient use of positive-emotion-related words. Because the frequency of patient negative emotion words was so low ($<1\%$), they were not analyzed.

Only mistrust of physicians was associated with use of positive-emotion words. *Higher* levels of mistrust predicted *less* patient use of positive-emotion words ($p = 0.02$).

Verbal Activity: The zero-order correlations revealed that physician word count was significantly associated ($p < 0.01$) with the composite measure of *level of patient verbal activity and the ratio of patient to physician verbal activity*. Thus, physician word count was entered into the regression models for both outcomes as a covariate. There were no other significant covariates.

As shown in Table 3, as predicted, Black patients who reported *some* past discrimination, compared to those who reported none, engaged in more absolute verbal activity ($p < 0.001$). Discrimination frequency did not predict this or any other outcome. As also predicted, *higher* levels of patient mistrust were also associated with *more* verbal activity ($p = 0.01$). As expected, suspicion was not associated with verbal activity.

With respect to the patient-physician ratio of verbal activity, as predicted, this ratio was *larger* (proportionally more patient verbal activity) among patients who reported *some* previous discrimination than among patients who reported *no* prior discrimination ($p = 0.01$). Mistrust of physicians and suspicion were not associated with this ratio.

Evaluations of Physicians: There was a negative association between physician implicit racial bias and patient perceptions of physicians' patient-centeredness ($p < 0.01$). Accordingly, physician implicit bias and study arm were included as covariates in analyses of the effects of patients' beliefs and attitudes on their perception of physicians' patient-centeredness.

As expected, perceived discrimination was not directly associated with either of the patient evaluations; nor was it indirectly associated via mistrust or suspicion. Only suspicion had a significant effect on perceived patient-centeredness. *Higher* levels of pre-interaction suspicion were associated with *lower* patient ratings of their physician's patient-centeredness ($p < 0.01$).

There were no significant covariates for analyses of patient trust of their physician. As predicted, *higher* levels of patient mistrust and suspicion were both associated with *lower* levels of post-interaction patient trust in their physician ($ps < 0.01$ and 0.03 , respectively).

Evaluations of Recommended Treatments: There were significant associations between patient ratings of physician patient-centeredness and both evaluations of recommended treatments (i.e., confidence and perceived difficulty) ($p \leq 0.05$). Thus, perceived patient-centeredness was entered as a covariate in analyses of patient evaluations of treatments.

Patients who had experienced *some* (versus no) discrimination expected *more* difficulty completing treatment ($p = 0.01$). Patients with *higher* levels of mistrust also expected more difficulty ($p = 0.05$). *Higher* levels of suspicion were associated with *lower* levels of patient confidence in the treatments ($p < 0.01$).

3.2.2. Physicians

Perceptions of Patients' Personal Attributes: There were associations between patient educational level, income, and physicians' ratings of patients' personal attributes ($p < 0.01$). These variables plus study arm were entered as covariates in analyses of associations between patients' beliefs and attitudes and physician perceptions.

Unexpectedly, we found that *higher* levels of patient suspicion were directly associated with *lower* physician perceptions of patients' personal attributes associated with successful treatment outcomes (e.g., intelligence, healthy lifestyle) ($p = 0.01$). As expected, neither perceived discrimination nor mistrust was directly associated with physicians' perceptions of patient attributes.

Physician Perceptions and Expectations: Indirect Effects: Recall that we predicted because physicians could not directly observe patients' beliefs or attitudes, any significant associations between these beliefs and attitudes and physicians' perceptions of patients' attributes and/or their treatment expectations would be indirect. We tested these predictions with analyses that included mistrust and suspicion, but not perceived discrimination because perceived discrimination was not significantly related to either physician perceptions or expectations.

Fig. 1 presents the conceptual model of the indirect relationships tested. In the model the direct cause is always a patient attitude (i.e., mistrust or suspicion) and the outcome is either physician perceptions of their patient or their treatment expectations. The mediator varies as a function of the specific model tested. For perceptions of patient attributes, it was the patients' verbal behavior; for physician treatment expectations, it was the physician perceptions. Overall, the model predicts that the stronger a patient's race-related attitudes, the less favorable are physician perceptions and/or expectations.

As reported, the only patient verbal behavior associated with *physicians' perceptions* of patient attributes was use of positive-emotion words; only physician mistrust was associated with this verbal behavior. Therefore, in the first mediation model, we only tested whether patients' verbal behavior mediated the relationship between their pre-interaction mistrust and physicians' perceptions of them (using the same covariates as in the regression analyses). The indirect path was significant. (See Fig. 2.) *Higher* levels of patient mistrust were indirectly associated with *lower* physician perceptions of their personal attributes, mediated through patients using fewer positive-emotion words.

We also predicted that any associations between patients' pre-interaction attitudes and physician treatment expectations would occur *indirectly*, mediated by physicians' perceptions of patient attributes. Suspicion was the only patient attitude directly associated with physician perceptions. Thus, we tested this indirect relationship between patient suspicion and physician treatment expectations mediated by physician perceptions (using the same covariates). Fig. 3 presents the two path models. The indirect association between level of patient suspicion and physicians' adherence expectations was significant. *Higher* levels of patient suspicion were associated with *lower* physician expectations for patient adherence mediated through lower ratings of patient attributes. There was also a significant indirect association between patient suspicion and physicians' treatment tolerance expectations. *Higher* levels of patient suspicion were also associated with *lower* physician expectations for patient tolerance of the treatments mediated through less favorable ratings of patient attributes.

The final mediation analysis tested a serial mediation model. As reported earlier, patient mistrust affected use of positive-emotion words, which affected physician perceptions of patient personal attributes. In intermediate mediation analyses, we tested whether there were indirect associations between patient use of positive-emotion words and physicians' treatment expectations, mediated by their perceptions of patients. The models were significant for both adherence and tolerance expectations, 95% *CrIs* = 0.04 to 0.35 and 0.02 to 0.25, respectively. Thus, we tested a serial mediation model in which patient mistrust affected their use of positive-emotion words, which affected physicians' perceptions of patient attributes, which, in turn affected physician perceptions of (a) adherence and (b) tolerance expectations. Although all individual paths in the models were significant, the analyses failed to support serial mediation.

3.3. Ancillary simultaneous regressions

When each of the beliefs and attitudes was entered *individually* into regression models, there was only one significant predictor for five of the eight outcomes (emotion-related words, verbal activity, perceived patient-centeredness, trust in the physician, confidence in treatment). Thus, as proposed, the individual attitudes and beliefs considered do appear to have unique effects. However, a more stringent test of whether these effects were *actually* unique would be to conduct analyses in which all three beliefs and attitudes were *simultaneously* entered in regression equations for each outcome (along with appropriate covariates). We did such analyses and all five unique effects were also found in these analyses. Copies of results of these analyses are available from the first author.

3.4. Summary of findings

3.4.1. Patients' behaviors and evaluations—Patient beliefs and attitudes had several significant direct effects on their verbal behaviors and evaluations. Patients higher in physician mistrust used fewer positive-emotion words and had higher levels of verbal activity (i.e., talked more) during interactions, and subsequently, reported less trust in their physician and anticipated more difficulty in completing recommended treatments. Patients who reported some past discrimination, compared to those who did not, demonstrated more verbal activity and anticipated more difficulty in completing treatments. Patients' healthcare

suspicion was unrelated to their verbal behaviors, but patients higher in suspicion evaluated their physicians as less patient-centered, had less trust in them, and less confidence in recommended treatments.

3.4.2. Physicians' perceptions and expectations—Patient attitudes primarily affected physicians indirectly. Physicians had less favorable perceptions of patients who reported higher mistrust towards physicians, mediated by patients' using fewer positive-emotion words during interactions. Physicians also had less positive treatment expectations for patients higher in suspicion, mediated by physicians' less favorable perceptions of patients.

4. Discussion

4.1. Race-related beliefs and attitudes and health disparities

4.1.1. Unique effects of perceived discrimination, physician mistrust, and healthcare suspicion—This study extends prior research on Black patients' race-related beliefs and attitudes and healthcare disparities by, first, showing that different types of pre-existing beliefs and attitudes uniquely effect how Black patients and their non-Black physicians react to racially discordant clinical interactions. That is, overall, the pattern of findings was consistent with the argument presented in the introduction: While they are related, perceived discrimination, mistrust, and suspicion have distinct characteristics that resulted in distinct effects on racially discordant interactions. Namely, because higher levels of perceived discrimination may primarily result in strategic behaviors intended to counter expected racial bias/discrimination, discrimination primarily affected verbal behaviors. Patient mistrust of physicians, which is most directly relevant to Black patients' reactions to racially discordant clinical interactions, had the broadest effects. And suspicion, which may primarily affect how patients scrutinize and interpret their physician's words and actions as the interaction unfolds, primarily affected patients' evaluations of physicians and their treatment recommendations.

4.1.2. The role of black patients in racially discordant clinical interactions—Results also showed that Black patients' race-related beliefs and attitudes affect more than their own reactions to racially discordant clinical interactions. They also indirectly affected both how they are perceived by their physicians and physicians' expectations for how patients will do with recommended treatments. More specifically, stronger race-related attitudes either directly or indirectly led to poorer physician perceptions of patient personal attributes associated with successful treatments and lower expectations for patients' responses to treatment.

These findings indicate that Black patients are far from the passive responders to physicians' attitudes and behaviors suggested in earlier writings (e.g., Smedley et al., 2003). The patients' race-related beliefs and attitudes shaped not only their own reactions to the racially discordant clinical interactions but their physicians' perceptions as well. Further, the physician perceptions and expectations that were affected could, quite arguably, lead to less aggressive and appropriate treatments. That is, they may contribute to the well-documented pervasive and persistent racial disparities in the treatment of cancer (Tehraniifar et al., 2009).

We are not, of course, suggesting that patients' race-related beliefs and attitudes are the only contributors to racial treatment disparities. Socio-economic factors, cultural differences and institutional and interpersonal racism all play important roles. Rather, our argument is simply that failure to acknowledge the importance of the race-related beliefs and attitudes Black patients bring to racially discordant clinical interactions results in an incomplete understanding of the causes of racial treatment disparities.

Further, it must be strongly emphasized that we do not want to "blame the victim." Black patients' perceptions of widespread discrimination, general mistrust of physicians, and suspicion about healthcare systems have substantial bases in reality. Unfortunately, healthcare in the US has a long and shameful history of racism and maltreatment of Black patients (Byrd and Clayton, 2002), and these disparities continue to exist (Agency for Healthcare Research and Quality, 2016). The onus is not on Black patients to change their beliefs and attitudes. Rather it is the responsibility of healthcare professionals and the institutions that provide healthcare to engage in concrete actions that will constructively address these patient beliefs and attitudes and provide equal quality healthcare to all patients.

4.2. Limitations

As the current study used a relatively small sample of primarily female breast cancer patients, further studies - with a broader gender representation of patients with other diseases - are needed to establish the generalizability of the findings. At the same time, the present findings are consistent with those of prior studies conducted in different clinical contexts (e.g., Hagiwara et al., 2013; Penner et al., 2009), as well as with more theoretical work on the dynamics of racially discordant clinical interactions (West and Schoenthaler, 2017). Thus, the results may well replicate in other conceptually comparable studies. Yet, such studies need to give special attention to replicating and explaining the unexpected direct association between patient suspicion and physician perceptions of their attributes.

Also, like most studies of clinical interactions, we were unable to examine longer-term, "downstream" effects of the study outcomes on actual decisions to begin, modify, or discontinue a treatment. Longitudinal studies are needed to study these effects. However, prior research finds associations between patient evaluations of their physicians and recommended treatments and their subsequent adherence (e.g., Haskard-Zolnierok et al., 2017). Other research shows that the kind of physician perceptions and expectations studied here may affect their subsequent treatment decisions (Calabrese et al., 2014; van Ryn et al., 2006).

Finally, the present research focused only on Black patients because prior research (Smedley et al., 2003) suggests their beliefs and attitudes may play a particularly important role in their reactions to clinical interactions. However, research examining beliefs and attitudes of White patients is also needed. We know, for example, that within each race/ethnicity, social class affects healthcare and people's beliefs and attitudes relevant to their healthcare (Agency for Healthcare Research and Quality, 2016; Markus, 2017). We strongly suspect that some of the disparities in healthcare attributed to social class are mediated by differences in class-related beliefs and attitudes. Such findings would not, however, negate our

conclusions. Instead, they would reinforce our more general argument that the beliefs and attitudes patients bring to clinical interactions are important determinants of outcomes of these interactions.

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Fig. 1.

Conceptual model of indirect effects of patients' race-related attitudes on physicians' reactions to patients: **Stronger** race-related attitudes result in **less** favorable physician responses to patients.

Fig. 2.
Indirect effects of patient mistrust on physician perceptions of patient attributes
*Significant 95% CrI.

Fig. 3. Indirect effects of patient suspicion on oncologists' adherence expectations (top panel) and treatment tolerance expectations (bottom panel).

*Significant 95% CrI.

Table 1

Characteristics of patients and oncologists.

Variable	Statistics
Patient Characteristics (<i>n</i> = 114)	
Mean age (<i>SD</i>)	58.89 (10.35)
Sex	
Female	104 (91%)
Male	9 (8%)
Education	
< High School	26 (22.8%)
Graduated High School	14 (12.3%)
Some College	38 (33.3%)
Graduated College	21 (18.4%)
Post-graduate degree	15 (13.2%)
Annual Household Income	
< \$19,999	46 (40.4%)
\$20,000 – \$39,999	32 (28.1%)
\$40,000 – \$59,999	10 (8.8%)
\$60,000 – \$79,999	10 (8.8%)
> \$80,000	9 (7.9%)
Tumor Site	
Breast	94 (82.4%)
Colorectal	8 (7.0%)
Lung	12 (10.5%)
Oncologist Characteristics (<i>n</i> = 18)	
Mean age (<i>SD</i>)	46.76 (10.60)
Sex	
Female	8 (44%)
Male	10 (56%)
Position	
Attending	15 (83.3%)
Fellow	3 (16.7%)
Race/Ethnicity	
White/Caucasian	10 (56%)
Asian/Pacific Islander	4 (22%)
Arab American/Middleeastern	4 (22%)

Table 2

Correlations among race-related beliefs and attitudes and patient and oncologist responses.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14
1. Discrimination Occurrence	–													
2. Discrimination Frequency	NA	–												
3. General Mistrust	0.35*	0.38*	–											
4. Suspicion	0.12	0.10	0.32*	–										
5. Verbal Activity	0.36*	0.10	0.27*	0.17	–									
6. Ratio Verbal Activity	0.24*	–0.03	0.10	0.11	0.60*	–								
7. Positive Emotion Words	–0.12	0.24*	–0.22†	–0.14	–0.29*	–0.39*	–							
8. Patient Centeredness	–0.08	–0.10	–0.11	–0.37*	0.05	0.15	0.08	–						
9. Trust in Oncologist	–0.19	0.08	–0.35*	–0.21†	–0.01	0.07	0.13	0.35*	–					
10. Confidence in Treatment	0.18	0.13	–0.18	–0.34*	–0.05	0.19	0.10	0.50*	0.21	–				
11. Treatment Difficulty	0.29*	0.19	0.24*	0.33*	0.18	0.09	–0.08	–0.29*	–0.12	–0.41*	–			
12. Patient Attributes	0.13	0.14	0.01	–0.33*	0.11	–0.04	0.23†	0.08	0.01	0.12	–0.02	–		
13. Treatment Adherence	0.05	0.04	–0.05	–0.10	–0.07	–0.19	0.19	0.03	0.11	0.20	–0.04	0.58*	–	
14. Treatment Tolerance	–0.03	–0.06	–0.11	–0.07	–0.07	–0.07	0.11	0.01	0.02	–0.003	–0.02	0.39*	0.34	–

† $p < 0.05$;

* $p < 0.01$.

Table 3

Race-related attitudes and beliefs and patient and physician reactions.

Outcomes	Predictors											
	Perceived Discrimination						General Mistrust					
	β	SE	p	95% CI	β	SE	p	95% CI	β	SE	p	95% CI
Verbal Activity	0.70	0.17	<0.01	0.35 to 1.05	0.24	0.09	0.01	0.05 to 0.42	0.11	0.12	ns	NA
Ratio of Verbal Activity	0.11	0.04	0.01	0.03 to 0.19	0.15	0.09	ns	NA	0.12	0.14	ns	NA
Positive-Emotion Words	0.22	0.17	ns	NA	-0.23	0.10	0.02	-0.43 to -0.03	0.16	0.10	ns	NA
Perceived Patient Centeredness	0.19	0.20	ns	NA	-0.13	0.05	ns	NA	-0.37	0.09	<0.01	-0.46 to -0.08
Trust in Oncologist	-0.41	0.21	ns	NA	-0.37	0.10	<0.01	-0.56 to -0.16	-0.26	0.11	0.03	-0.49 to -0.03
Confidence in Treatment	-0.27	0.21	ns	NA	0.11	0.10	ns	NA	-0.34	0.11	<0.01	-0.57 to -0.11
Treatment Difficulty	0.63	0.24	0.01	0.14 to 1.13	0.25	0.12	0.05	0.003 to 0.49	0.27	0.15	ns	NA
Patient Attributes	0.06	0.20	ns	NA	0.12	0.10	ns	NA	-0.21	0.07	0.01	-0.35 to -0.07