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Patient-Physician Interaction and Quality of Life in Recently Diagnosed Breast Cancer Patients

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Abstract

Introduction—Few studies have explored how patient-physician interactions influence patients' quality of life (QOL). In a prospective cohort study of 1,855 women diagnosed with invasive breast cancer in the Kaiser Permanente Northern California (KPNC) Medical Care Program from 2006 to 2011, we examined associations between patient-physician interactions during cancer treatment and QOL, overall and by racial/ethnic group.

Methods—Participants completed the Interpersonal Processes of Care (IPC) Survey at approximately eight months post-diagnosis to assess specific domains of the patient-physician interaction during the months after cancer diagnosis. Domains included: compassion, elicited concerns, explained results, decided together, lack of clarity, discrimination due to race/ethnicity, and disrespectful office staff. The Functional Assessment of Cancer Therapy-Breast Cancer (FACT-B) was completed concurrently to measure QOL. Linear regression models examined the association of IPC with QOL, first adjusting for patient covariates including age, race, clinical factors, and psychosocial measures and then for physician characteristics such as age, sex, race/ethnicity, and specialty.

Results—For all participants (n=1,855), IPC scores suggesting greater lack of clarity, discrimination due to race/ethnicity, and disrespectful office staff in patient-physician interactions were associated with lower QOL ($p<0.01$). IPC scores suggesting physicians demonstrating compassion, eliciting concerns, or explaining results were associated with higher QOL ($p<0.01$). Among Whites (n=1,306), only the associations with higher QOL remained. African Americans (n=110) who reported higher scores on physician compassion and elicited concerns had higher QOL, whereas higher scores for disrespectful office staff had lower QOL. No associations were observed among Asians (n=201) and Hispanics (n=186). After further adjustment for physician factors, the associations among Whites remained whereas those among African Americans disappeared.

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Conflict of Interest
The authors declare that they have no financial conflict of interest.

Conclusion—In the breast cancer treatment setting, characteristics of the patient-physician interaction as perceived by the patient are associated with QOL, yet were not specific to patient race/ethnicity.

Keywords

Quality of life; patient-physician interaction; interpersonal processes of care; breast cancer; survival

Introduction

More than 2.5 million female breast cancer survivors reside in the United States [1, 2], and incidence and survival rates differ by racial/ethnic group [3–5]. Studies of cancer patients, including breast, colorectal, and lung, suggest that the cancer care experience within one year after diagnosis can vary by race/ethnicity [6–8]. Few studies of the patient-physician interaction have been conducted exclusively in breast cancer patients.

The perception of breast cancer patients' interaction with their physicians and their quality of life (QOL) can potentially affect health outcomes independently. It has been reported that patient-physician interactions correlate with health outcomes, patient satisfaction, and medication adherence [9]. The QOL of cancer survivors has been shown to be associated with their perceived health outcomes [10]. Furthermore, studies have reported that individuals from racial/ethnic minorities with specific illnesses have lower QOL than their majority counterparts [11–13]. Thus, it is possible that patient-physician interactions affect patient health outcomes by affecting their QOL, or vice versa. However, no studies to date have examined the association between patient-physician interactions and QOL in breast cancer patients.

In this paper, we explore some of these issues in an ongoing cohort study of women diagnosed with breast cancer in the Kaiser Permanente Northern California (KPNC) integrated health care system. Specifically, we: 1) characterize the associations of patient-physician interactions with sociodemographic, psychosocial, clinical, and physician characteristics; 2) describe the associations of patient-physician interactions with QOL; and 3) examine whether these associations differ by race/ethnicity.

Methods

Study Population

The Pathways Study is an ongoing, prospective cohort study that has been actively recruiting women recently diagnosed with invasive breast cancer from KPNC since January 2006 [14]. Breast cancer diagnoses are ascertained by automatic scanning of electronic pathology reports with subsequent verification of cancer diagnosis and patient notification by medical record review. Study participants are KPNC members at the time of diagnosis with primary invasive breast cancer (any stage), at least 21 years of age at diagnosis, with no prior history of cancer other than non-melanoma skin cancer, ability to speak English, Spanish, Cantonese, or Mandarin, and living within a 65-mile radius from a Pathways field interviewer.

Passive consent is obtained from the patient's physician of record by email indicating the intention to contact the patient for study recruitment. All participants provide written informed consent before study enrollment, typically at the beginning of the in-person baseline interview, which occurs on average about two months after diagnosis. This study was approved by the Institutional Review Boards of KPNC and all collaborating institutions.

Data Collection

The present analysis is based on data collected at baseline and approximately eight months after enrollment at the first follow-up assessment. Most women at the follow-up timepoint were expected to be finished with their primary breast cancer treatment (surgery, chemotherapy, and/or radiation therapy). Other data related to diagnostic characteristics, clinical factors, and provider information were obtained from KPNC databases.

During the in-person baseline interview, demographic information was collected on race/ethnicity, education, marital status, employment status, and household income. Among other factors, QOL and a personality scale assessing outlook on life were also assessed at baseline, as described below. At follow-up, women reported information on aspects of their patient-physician interaction during the breast cancer diagnosis and treatment period and their current QOL.

Information on the principal caring physician for each woman was obtained from KPNC electronic medical records, as these details were not collected from the questionnaires. The selection criteria for the most relevant physician during the period from baseline until follow-up was based on the closest visit to the follow-up interview, the participant's office visit frequency, as well as the physician's specialty associated with the participant's breast cancer treatment, such as family medicine, hematology, internal medicine, medical oncology, obstetrician and gynecology, plastic surgery, radiation oncology, general surgery, and urgent care. A total of 1,855 physicians were matched to a corresponding patient. Thus, 1,855 women in the cohort had complete information on patient and physician characteristics and comprised the final dataset for the analysis.

Patient-Physician Interaction

Patient-physician interaction, the main factor of interest, was measured at follow-up using the Interpersonal Processes of Care (IPC) 18-item questionnaire [15]. Respondents were asked to report the frequency with which various aspects of the patient-physician interaction had occurred over the past six months. Five response choices ranging from "always" to "never" were provided for each question. IPC domains included: compassion (physician expressed concern about the patient's feelings, respectful of patient as a person), elicited concerns (physician let patient say what was important, heard patient's concerns and took them seriously), explained results (physician explained results of tests and physician-administered examinations), decided together (physician asked about the patient's preferences for helping decide treatment and worked out treatment plan together), lack of clarity (physician spoke quickly and used complex words), discrimination due to race/ethnicity (patient perceived discrimination or inattentiveness of physicians due to patient's race/ethnicity), and disrespectful office staff (office staff were negative and rude, gave patient a hard time, and talked down to patient) [16]. The physician for whom the survey responses were based was completely up to the participant's discretion, and the physician's name, specialty, or other identifiable characteristics were not asked.

For each domain, summary scores combining results from two or more items ranged from 1 to 5, and a higher IPC score indicates higher frequency of the specific process. IPC domains that score in a positive direction (better patient-physician interaction with increasing score) include: compassion, elicited concerns, explained results, and decided together. IPC domains that score toward a negative direction (worse patient-physician interaction with increasing score) include: lack of clarity, discrimination due to race/ethnicity, and disrespectful office staff. Scores for each of the seven domains reflected relatively limited variation, with responses clustering around scores indicating better patient-physician interactions. The scale reliability estimates for all IPC domains ranged from 0.73 to 0.89.

The Cronbach's alpha for the IPC domains were as follows: compassion (0.82), elicited concerns (0.82), explained results (0.85), decided together (0.77), lack of clarity (0.73), discrimination due to race/ethnicity (0.77), and disrespectful office staff (0.89).

Quality of Life

QOL was measured by the Functional Assessment of Cancer Therapy-Breast Cancer (FACT-B) Version 3 [17] at follow-up. The FACT-B consists of five subscales: physical well-being (PWB), functional well-being (FWB), emotional well-being (EWB), social/family well-being (SWB), and breast cancer-specific concerns (BCS). A total FACT-B score is calculated by summing the individual subscale scores. The instrument has a total of 45 items asking respondents to rate how true each statement is for the past 7 days. Response scales range from 0 (not at all) to 4 (very much), with "not applicable" as a choice option. The Cronbach's alpha for the composite FACT-B score was 0.92. The obtained scaled measures were transformed linearly to a 0–144 scale, with 0 being the worst QOL and 144 being the best QOL.

Clinical Characteristics

Data on AJCC tumor stage, hormone receptor status, breast cancer surgery type, and hormonal therapy, chemotherapy, and radiation therapy were obtained from the KPNC Cancer Registry [18].

Psychosocial Characteristics

Generalized optimism versus pessimism was measured by the Life Orientation Test-Revised (LOT-R), a 10-item survey administered at the baseline interview [19]. The five Likert-scale response choices range from "strongly agree" to "strongly disagree." There are no "cut-off" scores for optimism or pessimism.

The Medical Outcomes Study (MOS) Social Support Survey was administered during the baseline interview to assess various dimensions of perceived social support, and has been independently validated [20]. The survey consists of 19 functional support items separated into four dimensions: emotional/informational support, tangible support, positive social interaction, and affectionate support. Response choices for each item ranges from 1 (none of the time) to 5 (all of the time).

Statistical Analysis

To explore racial/ethnic differences in IPC, we compared mean scores by racial/ethnic group, and IPC continuous scores for each domain were categorized into five categories (1.0–1.9, 2.0–2.9, 3.0–3.9, 4.0–4.9, and 5.0). Group differences were calculated using the Kruskal-Wallis (K-W) test.

To understand general trends with patient and physician characteristics and prior to examining associations with QOL, continuous IPC scores were dichotomized into low and high categories based on the distribution of scores to ensure adequate numbers in each category. Domain scores were dichotomized as follows: 4.0 (compassion), 4.0 (elicited concerns), 4.0 (explained results), 4.0 (decided together), 1.5 (lack of clarity), 1.0 (discrimination due to race/ethnicity), and 1.0 (disrespectful office staff). We then tested the association of these dichotomous scores with each characteristic using the Pearson chi-square test.

To assess associations of IPC domain scores with QOL (both as continuous variables), we used multivariable linear regression, with the understanding that one unit increase or decrease in IPC score is associated with an increase or decrease in QOL of a magnitude

indicated by the regression coefficient for the IPC domain. Models were initially adjusted for the participants' sociodemographic and clinical characteristics, baseline QOL, life optimism from the LOT-R, and social support from the MOS (covariates listed in Table 2). Fully-adjusted models included covariates in the minimally-adjusted models, plus physician characteristics (covariates listed in Table 3).

Results

Table 1 describes QOL score at baseline and follow-up in the study population, overall and by race/ethnicity. In general, QOL increased from baseline to follow-up, except among African Americans and Other race/ethnicity. The highest overall QOL at baseline was observed among Whites, followed by African Americans, Asians, and Hispanics ($p<0.001$), whereas at follow-up, Whites and Hispanics maintained the highest and lowest QOL, respectively, yet Asians and African Americans became reversed ($p<0.001$).

Differences in IPC scores by select characteristics are shown in Table 2. Older women tended to report somewhat better patient-physician interactions. Specifically, for "explained results," 62.4% of women diagnosed at age 70 or older had a relatively high score, compared with 49.1% of women diagnosed less than 50 y. For "lack of clarity," 45% of women diagnosed at age 70 or older had a lower (meaning better) score, compared with proportionally more women with a better score (50.3%) diagnosed less than 50 y. Older women were also less likely to report higher scores on perceived "discrimination due to race/ethnicity", although only a small proportion overall reported more than low levels on this IPC domain. A higher proportion of minority women were also more likely to report higher scores on "lack of clarity" or "discrimination due to race/ethnicity", compared with White women. For "lack of clarity", 50% or greater proportion of African American, Asian, or Hispanic women reported higher scores on this IPC domain, compared to 42.4% of White women, whereas for "discrimination due to race/ethnicity", the comparable proportions were 9.1% to 16.4% for Hispanic, Asian, and African American women, compared to 2.8% for White women.

A higher proportion of women who were single or separated/divorced tended to report scores indicating less satisfactory patient-physician interaction, compared with women who were married/living as married or widowed. For example, 26.1% of single women and 23.2% of divorced/separated women reported higher scores on the "disrespectful office staff", compared with 17.4% of women who were married/living as married, or 16.3% of widowed women. Similar patterns were seen for "discrimination due to race/ethnicity" and "lack of clarity," with higher proportions of single women reporting higher scores on these domains compared with married or widowed women.

A higher proportion of women with higher educational attainment or employed at follow-up tended to report lower scores on IPC domains reflecting better patient-physician interaction, and higher scores on those indicating more problematic patient-physician interaction. For example, 55.9% of women who had post-college-graduate studies reported high scores on "compassion", compared with 70% of women with a high school degree or less. Similar patterns were seen for "elicited concerns" and "explained results," with opposite trends for "disrespectful office staff." Household income was largely unrelated to IPC domain scores.

Participants who scored higher on the LOT-R (greater life optimism), or higher on the MOS scale (greater social support), had higher IPC scores signifying better patient-physician interaction and lower scores indicating more problematic patient-physician interaction (Table 2). In general, IPC domain scores did not differ substantially by clinical characteristics (Table 2).

Given our interest in physician-patient interactions by race/ethnicity, distributions and mean scores for each IPC domain and overall QOL are given in Table 3, for the total cohort and by race/ethnicity. Scores differed among the racial/ethnic groups for the IPC domains of "elicited concerns", "lack of clarity", "discrimination due to race/ethnicity", and for QOL. African Americans had the highest mean scores for "elicited concerns" and "discrimination due to race/ethnicity". Hispanics reported the highest mean score for "lack of clarity".

The demographic characteristics of the physicians most frequently seen by the participants responding to the IPC survey are given in Table 4. Participants' perception of "discrimination due to race/ethnicity" varied by physician race/ethnicity. Those who received care from White or African American physicians reported higher scores for "discrimination due to race/ethnicity," whereas those who received care from Asian or Hispanic physicians had lower scores on this domain. Although physicians' race/ethnicity was associated with participants' self-report of "discrimination due to race/ethnicity", patient-physician concordance on race/ethnicity was unrelated to participants' report on discrimination (p=0.13).

Table 5 shows crude and multivariable-adjusted models of the association of IPC domain scores with QOL at eight months, overall and by racial/ethnic group. The first set of models (Multivariable Models 1) were adjusted for patient characteristics, including race/ethnicity, baseline QOL, and LOT-R scores, whereas the second set (Multivariable Models 2) were adjusted additionally for physician factors. In general, further adjustment for physician factors did not substantially change the effect estimates, as may be expected given the general lack of association of physician factors with IPC domain scores. Overall, patient-physician interactions characterized by higher scores on "discrimination due to race/ethnicity" (beta=−3.58; 95% CI: −5.89, −1.27) and "disrespectful office staff" (beta=−3.39; 95% CI: −5.38, −1.40) were associated with lower QOL. Increased "lack of clarity" was also associated with lower QOL, although the effects were weaker (beta=−1.34; 95% CI: −2.35, −0.34), especially after adjusting for physician factors (beta=−0.95; 95% CI: −2.10, 0.19). Higher scores on the IPC domains of "compassion" (beta=3.12; 95% CI: 1.94, 4.31), "elicited concerns" (beta=2.35; 95% CI: 1.18, 3.51), and "explained results" (beta=1.09; 95% CI: 0.12, 2.06) were associated with higher QOL.

In race-stratified crude analyses, the same overall patterns were generally observed across racial/ethnic groups. After adjustment for patient factors (Multivariable Models 1), these patterns were attenuated but still remained. "Decided together" was unrelated to QOL, whereas "compassion" and "elicited concerns" were positively associated with QOL, and "disrespectful office staff" and "discrimination due to race/ethnicity" were inversely associated with QOL. However, for Asians, IPC domain scores were largely unrelated to QOL, with effect estimates close to zero for almost all domains. Additional adjustment for physician factors had minimal but unpredictable effects on these associations, with some effect estimates increasing in magnitude and others decreasing, although the overall statistical significance was largely unchanged for most factors.

Discussion

To our knowledge, this study is the first to examine cross-sectional associations of patient-physician interactions, assessed by the Interpersonal Processes of Change (IPC) questionnaire [15], with quality of life (QOL) assessed by the FACT-B [17] across racial/ethnic groups of breast cancer patients who have completed their initial treatment. Overall, IPC scores indicated positive patient perceptions of the patient-physician interaction.

IPC domain scores indicating positive patient-physician interaction were positively associated with QOL. Higher scores on the IPC domains of compassion, elicited concerns, and explained results were associated with better QOL. Conversely, higher scores for domains indicating discrimination due to race/ethnicity and disrespectful office staff were associated with worse QOL. After adjustment for patient factors, including baseline QOL, these general patterns were observed for most racial/ethnic subgroups with the exception of Asians. Thus, we suggest that patient-physician interactions that are perceived to be positive may beneficially influence QOL across all racial/ethnic groups regardless of other characteristics such as age, marital status, and education for patients and gender, race/ethnicity, years of practice, and specialty for physicians.

To our knowledge, no studies have directly examined the association of patient-physician interactions and QOL. One study found that African Americans reporting higher scores for “disrespectful office staff” also reported greater satisfaction with their physicians [16]. While we did not specifically ask about satisfaction with physicians in our study, African American women who reported higher scores on “disrespectful office staff” reported lower QOL scores. This finding was concordant with observations of higher scores on “compassion” and “elicited concerns” with higher QOL in African Americans, and may be interpreted as discordant with the findings by Napoles et al. [16]. Alternatively, the patient may be satisfied with the physician, who may hold the role of compassionate, caring healer, while dissatisfied with the office staff, who may be viewed as a barrier to patient's access to the physician. It would be worthwhile to further examine the nuances of patient-physician interactions in African American women compared with their racial/ethnic counterparts.

The associations of individual IPC domains with QOL were largely as one may expect: women reporting higher scores on domains reflecting satisfaction with the patient-physician interaction (e.g., “compassion”, “elicited concerns”) had higher QOL scores, while those with higher scores on domains indicating negative associations (e.g., “discrimination due to race/ethnicity”, “disrespectful office staff”) had lower QOL scores. These observations were seen in the overall population, and with the same general order of magnitude among Whites, African Americans, and Hispanics, although for some domains, the associations were statistically significant only in the overall population and in Whites, likely due to smaller numbers in the other racial/ethnic groups. Interestingly, among the Asians, the effect estimates for virtually all IPC domains were markedly closer to the null value, suggesting for this subpopulation that these IPC domains are unrelated to QOL, or that they are not capturing key aspects of the patient-physician relationship of importance in influencing QOL.

As some patients might feel more comfortable discussing their diagnosis and care with physicians of their same race/ethnicity, we examined whether concordance of the physician’s race/ethnicity with that of the patient might influence IPC domain scores. We found no evidence that care provided by physicians of the same race/ethnicity as the patient resulted in better-perceived interpersonal care than that provided by physicians of different race/ethnicity. Our finding is consistent with two studies reporting that patient-physician race/ethnicity concordance did not affect primary care experiences in children [21] and health screening measures in adults [22]. Another study reported that among minority groups, racial/ethnic concordance between patients and providers was not associated with positive patient-physician interactions. Instead, the concordance was associated with patients’ perception of being treated with disrespect compared with unmatched race/ethnicity with the physician [23]. Other studies suggest that race concordance does affect patients’ health outcomes [24, 25]. We found that a physician’s display of compassion was associated with higher QOL of patients across different racial/ethnic groups regardless of

concordance. This observation suggests that patients view their physician's empathy in the patient-physician interaction as more important than of being of the same race/ethnicity.

While not the focus of our study, gender and language concordance is also an interesting topic. One study reported that physician and patient gender concordance was associated with less patient satisfaction, with male patients of female physicians reporting the highest patient satisfaction [26]. However, when we explored gender concordance in our QOL analyses, no associations were found. A cross-sectional study recently demonstrated that for patients with limited English proficiency, patient-physician language discordance was associated with poorer patient-physician interactions [27]. However, due to limited language information in patient-physician interactions in our study, we did not analyze this characteristic.

We did not observe the patient-physician interactions, nor collect data from our physicians, to evaluate how physicians perceive their interactions with their patients. Additionally, we did not ask participants which physician they were referencing when responding to the IPC survey. Thus, any inferences from our analyses related to physician attributes or characteristics should be made with considerable caution. Future studies that include both the patient and physician assessment of patient-physician interactions may provide additional insight on whether the overall experience of the patients and their physicians was mutual.

The association between IPC domain scores and QOL was cross-sectional, with both being assessed at approximately eight months post-breast cancer diagnosis. Thus causality between characteristics of the patient-physician interaction during active cancer treatment and patient QOL cannot be established. It is possible that patients experiencing better QOL could perceive that their interactions with their physicians and the health care system are more positive than patients with lower QOL. Indeed, baseline measures of life optimism and social support were positively associated with more positive patient-physician interactions. However, we adjusted for baseline QOL as well as social support and optimism scores in our multivariable analyses, and associations with IPC scores indicative of more satisfactory patient-physician interactions remained associated with greater QOL.

Overall, in this cross-sectional study of women with breast cancer, more positive patient-physician interactions are associated with higher levels of QOL. These observations generally do not appear to vary substantially by racial/ethnic group, although QOL in Asians appear to not be associated with measures of the patient-physician interaction after accounting for covariates. Positive patient-physician interactions may also encourage all women with breast cancer to be more compliant with physicians recommendations and cancer treatments, as well as reduce patient perceptions on unfair treatment [28–30]. The role of patient-physician interactions in the breast cancer care setting should continue to be explored, with the ultimate goal of delivering culturally-competent care to outcomes, including enhancement of QOL in women with breast cancer.

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Table 1

Quality of Life (QOL) at approximately 2 months (baseline) and 8 months after breast cancer diagnosis, Pathways Study, 2006–2011 (n=1,855)

	QOL Score			
	Mean	**SD**	**Min-Max**	**Median**
QOL at Baseline *†				
All (n=1,855)	112.1	18.6	40.0–144.0	115.0
White (n=1,306)	114.1	17.4	40.3–144.0	116.5
African American (n=110)	110.5	19.9	49.0–144.0	113.0
Asian (n=201)	105.7	21.5	50.7–144.0	108.8
Hispanic (n=186)	105.4	19.6	47.3–139.0	109.0
Other (n=52)	113.4	19.0	50.6–143.0	118.5
QOL at Follow-up *†				
All (n=1,855)	113.8	18.7	38.7–144.0	117.0
White (n=1,306)	115.2	17.7	38.7–144.0	118.0
African American (n=110)	109.5	21.3	41.7–142.0	113.3
Asian (n=201)	112.0	20.2	45.9–144.0	116.0
Hispanic (n=186)	108.9	20.4	58.0–140.6	113.6
Other (n=52)	111.9	20.9	57.8–142.0	118.0

*From FACT-B [17]

†All p<0.001 from from Kruskall-Wallis (K-W test) comparing mean scores across the racial/ethnic groups

Table 2

Demographic, psychosocial, and clinical characteristics of study participants by Interpersonal Processes of Care (IPC) domains, Pathways Study, 2006–2012 (n=1,855)

Characteristic	IPC Domain													
	Compassion		Elicited concerns		Explained results		Decided together		Lack of clarity*		Discrimination due to race/ethnicity*		Disrespectful office staff*	
	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)
Age at Follow-up (y)														
<50	138 (39.2)	214 (60.8)	138 (39.2)	214 (60.8)	179 (50.9)	173 (49.1)	191 (54.3)	161 (45.7)	175 (49.7)	177 (50.3)	327 (92.9)	25 (7.1)	273 (77.6)	79 (22.4)
50–59	206 (41.4)	292 (58.6)	197 (39.6)	301 (60.4)	201 (40.4)	297 (59.6)	255 (51.2)	243 (48.8)	262 (52.6)	236 (47.4)	458 (92.0)	40 (8.0)	393 (78.9)	105 (21.1)
60–69	210 (35.1)	389 (64.9)	224 (37.4)	375 (62.6)	223 (37.2)	376 (62.8)	290 (48.4)	309 (51.6)	351 (58.6)	248 (41.4)	580 (96.8)	19 (3.2)	497 (83.0)	102 (17.0)
70+	154 (38.3)	248 (61.7)	161 (40.1)	241 (59.9)	151 (37.6)	251 (62.4)	237 (59.0)	165 (41.0)	221 (55.0)	181 (45.0)	383 (95.3)	19 (4.7)	335 (83.3)	67 (16.7)
Unknown	2 (50.0)	2 (50.0)	1 (25.0)	3 (75.0)	0 (0.0)	4 (100.0)	2 (50.0)	2 (50.0)	2 (50.0)	2 (50.0)	4 (100.0)	0 (0.0)	4 (100.0)	0 (0.0)
	P = 0.19		P = 0.83		**P <0.001**		**P = 0.009**		**P = 0.045**		**P = 0.002**		P = 0.071	
Race/ethnicity														
White	520 (39.8)	786 (68.2)	515 (39.4)	791 (60.6)	516 (39.5)	790 (60.5)	672 (51.4)	634 (48.6)	752 (57.6)	554 (42.4)	1270 (97.2)	36 (2.8)	1062 (81.3)	244 (18.7)
African American	36 (32.7)	74 (67.3)	34 (30.9)	76 (69.1)	43 (39.1)	67 (60.9)	69 (62.7)	41 (37.3)	55 (50.0)	55 (50.0)	92 (83.6)	18 (16.4)	89 (80.9)	21 (19.1)
Asian	78 (38.8)	123 (61.2)	90 (44.8)	111 (55.2)	92 (45.8)	109 (54.2)	106 (52.7)	95 (47.3)	88 (43.8)	113 (56.2)	169 (84.1)	32 (15.9)	166 (82.6)	35 (17.4)
Hispanic	60 (32.3)	126 (67.7)	64 (34.4)	122 (65.6)	81 (43.6)	105 (56.4)	104 (55.9)	82 (44.1)	87 (46.8)	99 (53.2)	169 (91.0)	17 (9.1)	148 (79.6)	38 (20.4)
Other	16 (30.8)	36 (69.2)	18 (34.6)	34 (65.4)	22 (42.3)	30 (57.7)	24 (46.2)	28 (53.8)	29 (55.8)	23 (44.2)	52 (100.0)	0 (0.0)	37 (71.2)	15 (28.8)
	P = 0.14		P = 0.091		P = 0.45		P = 0.14		**P <0.001**		**P <0.001**		P =0.42	
Marital Status														
Married/ Living As Married	438 (37.2)	739 (62.8)	461 (39.2)	716 (60.8)	481 (40.9)	696 (59.1)	593 (50.4)	584 (49.6)	659 (56.00)	518 (44.0)	1126 (95.7)	51 (4.3)	972 (82.6)	205 (17.4)

Characteristic	IPC Domain													
	Compassion		Elicited concerns		Explained results		Decided together		Lack of clarity*		Discrimination due to race/ethnicity*		Disrespectful office staff*	
	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)
Widowed	74 (36.6)	128 (63.4)	75 (37.1)	127 (62.9)	69 (34.2)	133 (65.8)	112 (55.5)	90 (44.6)	117 (57.9)	85 (42.1)	192 (95.0)	10 (5.0)	169 (83.7)	33 (16.3)
Separated/Divorced	137 (41.3)	195 (58.7)	123 (37.1)	209 (62.9)	132 (39.8)	200 (60.2)	174 (52.4)	158 (47.6)	169 (50.9)	163 (49.1)	310 (93.4)	22 (6.6)	255 (76.8)	77 (23.2)
Single	61 (43.0)	81 (57.0)	62 (43.7)	80 (56.3)	72 (50.7)	70 (49.3)	95 (66.9)	47 (33.1)	65 (45.8)	77 (54.2)	122 (85.9)	20 (14.1)	105 (73.9)	37 (26.1)
Unknown	0 (0.0)	2 (100.0)	0 (0.0)	2 (100.0)	0 (0.0)	2 (100.0)	1 (50.0)	1 (50.0)	1 (50.0)	1 (50.0)	2 (100.0)	0 (0.0)	1 (50.0)	1 (50.0)
	P = 0.34		P = 0.54		**P = 0.022**		**P = 0.002**		**P = 0.044**		**P <0.001**		**P = 0.011**	
Educational Attainment														
High School or Less	82 (30.0)	191 (70.0)	75 (27.05)	198 (72.5)	91 (33.3)	182 (66.7)	133 (48.7)	140 (51.3)	164 (60.1)	109 (39.9)	258 (94.5)	15 (5.5)	242 (88.6)	31 (11.4)
Some College	244 (37.9)	399 (62.1)	240 (37.3)	403 (62.7)	249 (38.7)	394 (61.3)	339 (52.7)	304 (47.3)	350 (54.4)	293 (45.6)	611 (95.0)	32 (5.0)	530 (82.4)	113 (17.6)
College Graduate	191 (38.1)	310 (61.9)	226 (45.1)	275 (54.9)	229 (45.7)	272 (54.3)	276 (55.1)	225 (44.9)	254 (50.7)	247 (49.3)	470 (93.8)	31 (6.2)	397 (79.2)	104 (20.8)
Post-Graduate	193 (44.1)	245 (55.9)	180 (41.1)	258 (58.9)	185 (42.2)	253 (57.8)	227 (51.8)	211 (48.2)	243 (55.5)	195 (44.5)	413 (94.3)	25 (5.7)	333 (76.0)	105 (24.0)
	P = 0.003		**P < 0.001**		**P = 0.005**		P = 0.39		P = 0.089		P = 0.85		**P < 0.001**	
Employment Status at Follow-up														
No	391 (35.9)	697 (64.1)	402 (37.0)	686 (63.0)	421 (38.7)	667 (61.3)	582 (53.5)	506 (46.5)	598 (55.0)	490 (45.0)	1036 (95.2)	52 (4.8)	900 (82.7)	188 (17.3)
Yes	319 (41.6)	447 (58.4)	319 (41.6)	447 (58.4)	333 (43.5)	433 (56.5)	393 (51.3)	373 (48.7)	412 (53.8)	354 (46.2)	716 (93.5)	50 (6.5)	602 (78.6)	164 (21.4)
Unknown	0 (0.0)	1 (100.0)	0 (0.0)	1 (100.0)	0 (0.0)	1 (100.0)	0 (0.0)	1 (100.0)	1 (100.0)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)	1 (100.0)
	P = 0.013		**P = 0.041**		**P = 0.039**		P = 0.35		P = 0.62		P = 0.10		**P = 0.026**	
Household Income at Follow-up														
< $25,000	53 (32.9)	108 (67.1)	53 (32.9)	108 (67.1)	63 (39.1)	98 (60.9)	88 (54.7)	73 (45.3)	83 (51.6)	78 (48.5)	146 (90.7)	15 (9.3)	122 (75.8)	39 (24.2)

Characteristic	IPC Domain													
	Compassion		Elicited concerns		Explained results		Decided together		Lack of clarity*		Discrimination due to race/ethnicity*		Disrespectful office staff*	
	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)
$25,000–49,999	141 (39.7)	214 (60.3)	138 (38.9)	217 (61.1)	141 (39.7)	214 (60.3)	201 (56.6)	154 (43.4)	202 (56.9)	153 (43.1)	331 (93.2)	24 (6.8)	285 (80.3)	70 (19.7)
$50,000–89,999	218 (39.4)	336 (60.7)	212 (38.3)	342 (61.7)	226 (40.8)	328 (59.2)	297 (53.6)	257 (46.4)	291 (52.5)	263 (47.5)	519 (93.7)	35 (6.3)	452 (81.6)	102 (18.4)
$90,000+	233 (39.0)	365 (61.0)	249 (41.6)	349 (58.4)	246 (41.1)	352 (58.9)	291 (48.7)	307 (51.3)	330 (55.2)	268 (44.8)	575 (96.2)	23 (3.9)	487 (81.4)	111 (18.6)
Unknown	65 (34.8)	122 (65.2)	69 (36.9)	118 (63.1)	78 (41.7)	109 (58.3)	98 (52.4)	89 (47.6)	105 (56.2)	82 (43.9)	181 (96.8)	6 (3.2)	156 (83.4)	31 (16.6)
	P = 0.47		P = 0.22		P = 0.95		P = 0.089		P = 0.50		**P = 0.034**		P = 0.39	
Life Optimism Score														
Mean (SD)	19.10 (3.33)	19.85 (3.41)	19.24 (3.28)	19.77 (3.45)	19.32 (3.26)	19.74 (3.48)	19.33 (3.34)	19.83 (3.45)	19.98 (3.40)	19.06 (3.33)	19.65 (3.39)	18.20 (3.30)	19.68 (3.39)	19.07 (3.39)
	P <0.001		**P <0.001**		**P <0.001**		**P = 0.003**		**P <0.001**		**P = <0.001**		**P = 0.001**	
Social Support Score														
Mean (SD)	72.8 (19.4)	84.2 (15.8)	74.0 (19.1)	83.5 (16.4)	74.5 (19.2)	83.5 (16.3)	76.0 (18.8)	84.1 (16.3)	82.9 (17.0)	76.2 (18.7)	80.6 (17.7)	66.2 (19.6)	81.4 (17.3)	73.3 (19.9)
	P <0.001		**P <0.001**		**P <0.001**		**P <0.001**		**P <0.001**		**P <0.001**		**P <0.001**	
AJCC Stage at Diagnosis														
I	360 (37.9)	589 (62.1)	375 (39.5)	574 (60.5)	376 (39.6)	573 (60.4)	468 (49.3)	481 (50.9)	513 (54.1)	436 (45.9)	895 (94.3)	54 (5.7)	754 (79.5)	195 (20.5)
II	250 (40.8)	363 (59.2)	236 (38.5)	377 (61.5)	260 (42.4)	353 (57.6)	334 (54.5)	279 (45.5)	344 (56.1)	269 (43.9)	581 (94.8)	32 (5.2)	501 (81.7)	112 (18.3)
III	66 (34.7)	124 (65.3)	68 (35.8)	122 (64.2)	74 (39.0)	116 (61.0)	116 (61.0)	74 (39.0)	89 (46.8)	101 (53.2)	177 (93.2)	13 (6.8)	158 (83.2)	32 (16.8)
IV	10 (45.5)	12 (54.6)	9 (40.9)	13 (59.1)	11 (50.0)	11 (50.0)	17 (77.3)	5 (22.7)	13 (59.1)	9 (40.9)	21 (95.5)	1 (4.5)	19 (86.4)	3 (13.6)
Unknown	24 (29.6)	57 (70.4)	33 (40.7)	48 (59.3)	33 (40.7)	48 (59.3)	40 (49.4)	41 (50.6)	52 (64.2)	29 (35.8)	78 (96.3)	3 (3.7)	70 (86.4)	11 (13.6)
	P = 0.39		P = 0.80		P = 0.53		**P = 0.001**		P = 0.15		P = 0.86		P = 0.47	
Surgery Type at Follow-up														

Characteristic	IPC Domain													
	Compassion		Elicited concerns		Explained results		Decided together		Lack of clarity*		Discrimination due to race/ethnicity*		Disrespectful office staff*	
	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)
None	6 (35.3)	11 (64.7)	4 (23.5)	13 (76.5)	6 (35.3)	11 (64.7)	9 (52.9)	8 (47.1)	10 (58.8)	7 (41.2)	16 (94.1)	1 (5.9)	14 (82.4)	3 (17.7)
Lumpectomy	449 (39.4)	690 (60.6)	438 (38.5)	701 (61.5)	467 (41.0)	672 (59.0)	592 (52.0)	547 (48.0)	646 (56.7)	493 (43.3)	1086 (95.4)	53 (4.6)	926 (81.3)	213 (18.7)
Mastectomy	255 (36.5)	444 (63.5)	279 (39.9)	420 (60.1)	281 (40.2)	418 (59.8)	374 (53.5)	325 (46.5)	355 (50.8)	344 (49.2)	650 (93.0)	49 (7.0)	562 (80.4)	137 (19.6)
	P = 0.44		P = 0.35		P = 0.85		P = 0.82		**P = 0.044**		P = 0.10		P = 0.88	
Hormonal Therapy Status at Follow-up														
Ever	483 (37.9)	792 (62.1)	497 (39.0)	778 (61.0)	520 (40.8)	755 (59.2)	665 (52.2)	610 (47.8)	708 (55.5)	567 44.5)	1209 (94.8)	66 (5.2)	1037 (81.3)	238 (18.7)
Never	216 (38.8)	341 (61.2)	216 (38.8)	341 (61.2)	225 (40.4)	332 (59.6)	294 (52.8)	263 (47.2)	291 (52.2)	266 (47.8)	521 (93.5)	36 (6.5)	447 (80.3)	110 (19.7)
Unknown	11 (47.8)	12 (52.2)	8 (34.8)	15 (65.2)	9 (39.1)	14 (60.9)	16 (69.6)	7 (30.4)	12 (52.2)	11 (47.8)	22 (95.7)	1 (4.3)	18 (78.3)	5 (21.7)
	P = 0.72		P = 0.94		P = 0.88		P = 0.81		P = 0.19		P = 0.27		P = 0.59	
Chemotherapy Status at Follow-up														
Ever	315 (37.1)	535 (62.9)	307 (36.1)	543 (63.9)	363 (42.7)	487 (57.3)	453 (53.3)	397 (46.7)	459 (54.0)	391 (46.0)	804 (94.6)	46 (5.4)	689 (81.1)	161 (18.9)
Never	388 (39.3)	600 (60.7)	409 (41.4)	579 (58.6)	384 (38.9)	604 (61.1)	514 (52.0)	474 (48.0)	546 (55.3)	442 (44.7)	931 (94.2)	57 (5.8)	799 (80.9)	189 (19.1)
Unknown	7 (41.2)	10 (58.8)	5 (29.4)	12 (70.6)	7 (41.2)	10 (58.8)	8 (47.1)	9 (52.9)	6 (35.3)	11 (64.7)	17 (100.0)	0 (0.0)	14 (82.4)	3 (17.6)
	P = 0.33		**P = 0.021**		P = 0.095		P = 0.59		P = 0.59		P = 0.74		P = 0.92	
Radiation Therapy Status at Follow-up														
Ever	312 (39.9)	471 (60.1)	320 (40.9)	463 (59.1)	315 (40.2)	468 (59.8)	416 (53.1)	367 (46.9)	435 (55.6)	348 (44.4)	740 (94.5)	43 (5.5)	634 (81.0)	149 (19.0)
Never	398 (37.1)	674 (62.9)	401 (37.4)	671 (62.6)	439 (40.9)	633 (59.1)	559 (52.2)	513 (47.8)	576 (53.7)	496 (46.3)	1012 (94.4)	60 (5.6)	868 (81.0)	204 (19.0)
	P = 0.23		P = 0.13		P = 0.75		P = 0.68		P = 0.44		P = 0.92		P = 1.00	

NOTE: Low and high were dichotomized by the following scores: 4.0 (compassion), 4.0 (elicited concerns), 4.0 (explained results), 4.0 (decided together), 1.5 (lack of clarity), 1.0 (discrimination due to race/ethnicity), 1.0 (disrespectful office staff). P values were calculated from Pearson chi-square test.

*Scoring in negative direction, higher scores indicate poorer patient-physician interaction

Table 3

Distribution of Interpersonal Processes of Care (IPC) domains approximately 8 months after diagnosis among 1,855 women diagnosed with breast cancer

IPC Domain	IPC Score						
	1.0–1.9 n (%)	2.0–2.9 n (%)	3.0–3.9 n (%)	4.0–4.9 n (%)	5.0 n (%)	Mean Continuous Score	P value*
Compassion							
All (n=1,855)	6 (0.32)	42 (2.26)	325 (17.52)	867 (46.74)	615 (33.15)	4.34	---
White (n=1,306)	5 (0.38)	26 (1.99)	233 (17.84)	644 (49.31)	398 (30.47)	4.32	0.066
African American (n=110)	0 (0.00)	4 (3.64)	20 (18.18)	42 (38.18)	44 (40.00)	4.38	
Asian (n=201)	0 (0.00)	5 (2.49)	35 (17.41)	86 (42.79)	75 (37.31)	4.36	
Hispanic (n=186)	1 (0.54)	6 (3.23)	29 (15.59)	71 (38.17)	79 (42.47)	4.39	
Elicited concerns							
All (n=1,855)	7 (0.38)	50 (2.70)	284 (15.31)	979 (52.78)	535 (28.84)	4.32	---
White (n=1,306)	5 (0.38)	25 (1.91)	196 (15.01)	726 (55.59)	354 (27.11)	4.32	**0.006**
African American (n=110)	0 (0.00)	4 (3.64)	10 (9.09)	54 (49.09)	42 (38.18)	4.44	
Asian (n=201)	2 (1.00)	9 (4.48)	47 (23.38)	89 (44.28)	54 (26.87)	4.18	
Hispanic (n=186)	0 (0.00)	11 (5.91)	26 (13.98)	80 (43.01)	69 (37.10)	4.35	
Explained results							
All (n=1,855)	11 (0.59)	59 (3.18)	240 (12.94)	663 (35.74)	882 (47.55)	4.37	---
White (n=1,306)	6 (0.46)	36 (2.76)	159 (12.17)	479 (36.68)	626 (47.93)	4.39	0.31
African American (n=110)	0 (0.00)	4 (3.64)	16 (14.55)	34 (30.91)	56 (50.91)	4.40	
Asian (n=201)	1 (0.50)	10 (4.98)	26 (12.94)	77 (38.31)	87 (43.28)	4.28	
Hispanic (n=186)	4 (2.15)	8 (4.30)	31 (16.67)	53 (28.49)	90 (48.39)	4.26	
Decided together							
All (n=1,855)	72 (3.88)	153 (8.25)	338 (18.22)	685 (36.93)	607 (32.72)	4.01	---
White (n=1,306)	47 (3.60)	102 (7.81)	238 (18.22)	485 (37.14)	434 (33.23)	4.03	0.20
African American (n=110)	6 (5.45)	12 (10.91)	20 (18.18)	37 (33.64)	35 (31.82)	3.86	
Asian (n=201)	3 (1.49)	23 (11.44)	35 (17.41)	74 (36.82)	66 (32.84)	4.03	
Hispanic (n=186)	15 (8.06)	9 (4.84)	38 (20.43)	71 (38.17)	53 (28.49)	3.87	
Lack of clarity†							
All (n=1,855)	624 (33.64)	860 (46.36)	343 (18.49)	23 (1.24)	5 (0.27)	1.72	---

IPC Domain	IPC Score						
	1.0–1.9 n (%)	2.0–2.9 n (%)	3.0–3.9 n (%)	4.0–4.9 n (%)	5.0 n (%)	Mean Continuous Score	P value*
White (n=1,306)	471 (36.06)	598 (45.79)	225 (17.23)	10 (0.77)	2 (0.15)	1.67	**<0.001**
African American (n=110)	34 (30.91)	55 (50.00)	21 (19.09)	0 (0.00)	0 (0.00)	1.75	
Asian (n=201)	54 (26.87)	94 (46.77)	46 (22.89)	7 (3.48)	0 (0.00)	1.87	
Hispanic (n=186)	49 (26.34)	87 (46.77)	41 (22.04)	6 (3.23)	3 (1.61)	1.89	
Discrimination due to race/ethnicity†							
All (n=1,855)	1752 (94.45)	71 (3.83)	26 (1.40)	3 (0.16)	3 (0.16)	1.06	---
White (n=1,306)	1270 (97.24)	26 (1.99)	9 (0.69)	0 (0.00)	1 (0.08)	1.03	**<0.001**
African American (n=110)	92 (83.64)	9 (8.18)	6 (5.45)	2 (1.82)	1 (0.91)	1.24	
Asian (n=201)	169 (84.08)	27 (13.43)	4 (1.99)	1 (0.50)	0 (0.00)	1.15	
Hispanic (n=186)	169 (90.86)	9 (4.84)	7 (3.76)	0 (0.00)	1 (0.54)	1.13	
Disrespectful office staff†							
All (n=1,855)	1,502 (80.97)	298 (16.06)	48 (2.59)	5 (0.27)	2 (0.11)	1.14	---
White (n=1,306)	1,062 (81.32)	217 (16.62)	25 (1.91)	1 (0.08)	1 (0.08)	1.13	0.83
African American (n=110)	89 (0.91)	13 (11.82)	6 (5.45)	2 (1.82)	0 (0.00)	1.21	
Asian (n=201)	166 (82.59)	26 (12.94)	9 (4.48)	0 (0.00)	0 (0.00)	1.14	
Hispanic (n=186)	148 (79.57)	28 (15.05)	7 (3.76)	2 (1.08)	1 (0.54)	1.20	

NOTE: 1,855 women completed the entire IPC questionnaire. Other patient race (n=52) excluded due to insufficient data

*P value from Kruskall-Wallis (K-W test) comparing mean IPC domain scores across four racial/ethnic groups

†Scoring in negative direction, higher scores indicate poorer patient-physician interaction

Table 4

Physician characteristics by study participant response to IPC domains, Pathways Study, 2006–2012 (n=1,855)

	IPC Domain													
	Compassion		**Elicited concerns**		**Explained results**		**Decided together**		**Lack of clarity**		**Discrimination due to race/ethnicity**		**Disrespectful office staff**	
	Low n (%)	**High n (%)**	**Low n (%)**	**High n (%)**	**Low n (%)**	**High n (%)**	**Low n (%)**	**High n (%)**	**Low n (%)**	**High n (%)**	**Low n (%)**	**High n (%)**	**Low n (%)**	**High n (%)**
Race/Ethnicity														
White	301 (37.6)	499 (62.4)	310 (38.8)	490 (61.2)	323 (40.4)	477 (59.6)	408 (51.0)	392 (49.0)	440 (55.0)	360 (45.0)	752 (94.0)	48 (6.0)	646 (80.8)	154 (19.2)
African American	27 (49.1)	28 (50.9)	28 (50.9)	27 (49.1)	23 (41.8)	32 (58.2)	30 (54.6)	25 (45.4)	30 (54.6)	25 (45.4)	48 (87.3)	7 (12.7)	45 (81.8)	10 (18.2)
Asian	268 (37.8)	442 (62.2)	262 (36.9)	448 (63.1)	296 (41.7)	414 (58.3)	382 (53.8)	328 (46.2)	388 (54.7)	322 (45.3)	679 (95.6)	31 (4.4)	587 (82.7)	123 (17.3)
Hispanic	13 (40.6)	19 (59.4)	13 (40.6)	19 (59.4)	16 (50.0)	16 (50.0)	17 (53.1)	15 (46.9)	22 (68.8)	10 (31.2)	32 (100.0)	0 (0.0)	28 (87.5)	4 (12.5)
Other	2 (100)	0 (0.0)	2 (100.0)	0 (0.0)	1 (50.0)	1 (50.0)	2 (100.0)	0 (0.0)	0 (0.0)	2 (100.0)	1 (50.0)	1 (50.0)	1 (50.0)	1 (50.0)
Unknown	99 (38.7)	157 (61.3)	106 (41.4)	150 (58.6)	95 (37.1)	161 (62.9)	136 (53.1)	120 (46.9)	131 (51.2)	125 (48.8)	240 (93.7)	16 (6.3)	195 (76.2)	61 (23.8)
	P = 0.18		P = 0.11		P = 0.85		P = 0.54		P = 0.29		**P = 0.002**		P = 0.56	
Race Concordance with Patient														
Yes	262 (38.7)	415 (61.3)	263 (38.9)	414 (61.1)	269 (39.7)	408 (60.3)	341 (50.4)	336 (49.6)	383 (56.6)	294 (43.4)	647 (95.6)	30 (4.4)	551 (81.4)	126 (18.6)
No	349 (37.9)	573 (62.1)	352 (38.2)	570 (61.8)	390 (42.3)	532 (57.7)	498 (54.0)	424 (43.0)	497 (53.9)	425 (46.1)	865 (93.8)	57 (6.2)	756 (82.0)	166 (18.0)
Unknown	99 (38.7)	157 (61.3)	106 (41.4)	150 (58.6)	95 (37.1)	161 (62.9)	136 (53.1)	120 (46.9)	131 (51.2)	125 (48.8)	240 (93.8)	16 (6.2)	195 (76.2)	61 (23.8)
	P = 0.73		P = 0.79		P = 0.30		P = 0.15		P = 0.29		P = 0.13		P = 0.76	
Age at Patient's Follow-up														
<39	215 (36.9)	367 (63.1)	213 (36.6)	369 (63.4)	226 (38.8)	356 (61.2)	297 (51.0)	285 (49.0)	322 (55.3)	260 (44.7)	555 (95.4)	27 (4.6)	476 (81.8)	106 (18.2)
40–49	217 (37.9)	355 (62.1)	224 (39.2)	348 (60.8)	243 (42.5)	329 (57.5)	293 (51.2)	279 (48.8)	304 (53.2)	268 (46.9)	538 (94.1)	34 (5.9)	456 (79.7)	116 (20.3)

	IPC Domain													
	Compassion		Elicited concerns		Explained results		Decided together		Lack of clarity		Discrimination due to race/ethnicity		Disrespectful office staff	
	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)	Low n (%)	High n (%)
50–59	156 (41.7)	218 (58.3)	157 (42.0)	217 (58.0)	163 (43.6)	211 (56.4)	207 (55.4)	167 (44.7)	204 (54.6)	170 (45.4)	350 (93.6)	24 (6.4)	308 (82.4)	66 (17.6)
60+	48 (36.6)	83 (63.4)	47 (35.9)	84 (64.1)	48 (36.6)	83 (63.4)	73 (55.7)	58 (44.3)	78 (59.5)	53 (40.5)	126 (96.2)	5 (3.8)	107 (81.7)	24 (18.3)
Unknown	74 (37.8)	122 (62.2)	80 (40.8)	116 (59.2)	74 (37.8)	122 (62.2)	105 (53.6)	91 (46.4)	103 (52.6)	93 (47.4)	183 (93.4)	13 (6.6)	155 (79.1)	41 (20.9)
	P = 0.48		P = 0.35		P = 0.29		P = 0.45		P = 0.60		P = 0.50		P = 0.73	
Sex														
Male	359 (38.9)	564 (61.1)	360 (39.0)	563 (61.0)	377 (40.9)	546 (59.1)	490 (53.1)	433 (46.9)	512 (55.5)	411 (44.5)	869 (94.2)	54 (5.8)	762 (82.6)	161 (17.4)
Female	279 (37.6)	463 (62.4)	283 (38.1)	459 (61.9)	304 (41.0)	438 (59.0)	383 (51.6)	359 (48.4)	398 (53.6)	344 (46.4)	706 (95.2)	36 (4.8)	591 (79.7)	151 (20.4)
Unknown	72 (37.9)	118 (62.1)	78 (41.1)	112 (58.9)	73 (38.4)	117 (61.6)	102 (53.7)	88 (46.3)	101 (53.2)	89 (46.8)	177 (93.2)	13 (6.8)	149 (78.4)	41 (21.6)
	P = 0.59		P = 0.72		P = 0.96		P = 0.55		P = 0.46		P = 0.37		P = 0.13	
Years of Practice at KPNC														
<1 year	107 (37.8)	176 (62.2)	111 (39.2)	172 (60.8)	108 (38.2)	175 (61.8)	146 (51.6)	137 (48.4)	152 (53.7)	131 (46.3)	266 (94.0)	17 (6.0)	224 (79.2)	59 (20.8)
1–5 years	273 (38.8)	430 (61.2)	273 (38.8)	430 (61.2)	290 (41.3)	413 (58.7)	365 (51.9)	338 (48.1)	399 (56.8)	304 (43.2)	661 (94.0)	42 (6.0)	558 (79.4)	145 (20.6)
6–10 years	132 (36.3)	232 (63.7)	143 (39.3)	221 (60.7)	150 (41.2)	214 (58.8)	193 (53.0)	171 (47.0)	188 (51.7)	176 (48.3)	350 (96.2)	14 (3.8)	304 (83.5)	60 (16.5)
11–20 years	101 (38.4)	162 (61.6)	98 (37.3)	165 (62.7)	111 (42.2)	152 (57.8)	133 (50.6)	130 (49.4)	140 (53.2)	123 (46.8)	247 (93.9)	16 (6.1)	218 (82.9)	45 (17.1)
>20 years	97 (40.1)	145 (59.9)	96 (39.7)	146 (60.3)	95 (39.3)	147 (60.7)	138 (57.0)	104 (43.0)	132 (54.6)	110 (45.4)	228 (94.2)	14 (5.8)	198 (81.8)	44 (18.2)
	P = 0.90		P = 0.98		P = 0.86		P = 0.63		P = 0.58		P = 0.64		P = 0.40	
Clinical Specialty														
Oncology (Medical/Radiation)	409 (37.4)	685 (62.6)	417 (38.1)	677 (61.9)	438 (40.0)	656 (30.0)	572 (52.3)	522 (47.7)	596 (54.5)	498 (45.5)	1040 (95.1)	54 (4.9)	901 (82.4)	193 (17.6)

	IPC Domain													
	Compassion		**Elicited concerns**		**Explained results**		**Decided together**		**Lack of clarity**		**Discrimination due to race/ethnicity**		**Disrespectful office staff**	
	Low n (%)	**High n (%)**	**Low n (%)**	**High n (%)**	**Low n (%)**	**High n (%)**	**Low n (%)**	**High n (%)**	**Low n (%)**	**High n (%)**	**Low n (%)**	**High n (%)**	**Low n (%)**	**High n (%)**
Surgery (General/Plastic)	89 (37.7)	147 (62.3)	92 (39.0)	144 (61.0)	94 (39.8)	142 (60.2)	117 (49.6)	119 (50.4)	128 (54.2)	108 (45.8)	219 (92.8)	17 (7.2)	187 (79.2)	49 (20.8)
Other	140 (41.8)	195 (58.2)	134 (40.0)	201 (60.0)	149 (44.5)	186 (55.5)	184 (54.9)	151 (45.1)	186 (55.5)	149 (44.5)	316 (94.3)	19 (5.7)	265 (79.1)	70 (20.9)
Unknown	72 (37.9)	118 (62.1)	78 (41.1)	112 (58.9)	73 (38.4)	117 (61.6)	102 (53.7)	88 (46.3)	101 (53.2)	89 (46.8)	177 (93.2)	13 (6.8)	149 (78.4)	41 (21.6)
	P = 0.34		P = 0.82		P = 0.33		P = 0.45		P = 0.94		P = 0.37		P = 0.28	

NOTE: Low and high were dichotomized by the following scores: 4.0 (compassion), 4.0 (elicited concerns), 4.0 (explained results), 4.0 (decided together), 1.5 (lack of clarity), 1.0 (discrimination due to race/ethnicity), 1.0 (disrespectful office staff). Ps were calculated from Pearson chi-square test.

Table 5

Regression coefficients (Beta) and 95% confidence interval (CI) for IPC domains with QOL at approximately 8 months after diagnosis, total population and according to race/ethnicity, Pathways Study, 2006–2012

	Total (n=1,855) Beta (95% CI)	White (n=1,306) Beta (95% CI)	African American (n=110) Beta (95% CI)	Asian (n=201) Beta (95% CI)	Hispanic (n=186) Beta (95% CI)
Crude Models					
Compassion (+)	**8.36 (7.13, 9.59)**	**8.25 (6.83, 9.67)**	**11.88 (6.51, 17.24)**	**7.29 (3.25, 11.32)**	**9.93 (6.14, 13.73)**
Elicited concerns (+)	**7.47 (6.22, 8.71)**	**7.54 (6.07, 9.01)**	**11.87 (6.05, 17.70)**	**5.40 (1.93, 8.86)**	**9.55 (5.67, 13.42)**
Explained results (+)	**6.44 (5.38, 7.50)**	**6.21 (4.95, 7.46)**	4.17 (−1.13, 9.47)	**5.81 (2.51, 9.11)**	**7.64 (4.67, 10.60)**
Decided together (+)	**3.46 (2.64, 4.28)**	**3.11 (2.17, 4.06)**	3.41 (−0.26, 7.08)	**4.16 (1.32, 7.00)**	**4.02 (1.48, 6.57)**
Lack of clarity (−)*	**−5.67 (−6.89, −4.46)**	**−5.32 (−6.75, −3.89)**	−4.86 (−11.02, 1.30)	**−6.85 (−10.63, −3.08)**	**−4.28 (−7.91, −0.66)**
Discrimination due to race/ethnicity (−)*	**−9.23 (−11.85, −6.63)**	**−6.52 (−10.98, −2.06)**	**−7.43 (−13.33, −1.54)**	**−8.31 (−15.18, −1.44)**	**−12.00 (−17.89, −6.10)**
Disrespectful office staff (−)*	**−9.46 (−11.67, −7.24)**	**−8.51 (−11.40, −5.61)**	**−13.54 (−20.47, −6.61)**	−5.93 (−13.16, 1.30)	**−8.11 (−13.53, −2.71)**
Multivariable Models 1†					
Compassion (+)	**3.15 (2.08, 4.23)**	**2.88 (1.62, 4.14)**	**6.51 (0.28, 12.73)**	1.78 (−1.76, 5.32)	3.46 (−0.57, 7.50)
Elicited concerns (+)	**2.74 (1.67, 3.81)**	**3.15 (1.91, 4.39)**	**7.96 (0.12, 15.80)**	0.14 (−3.02, 3.29)	2.64 (−1.69, 6.97)
Explained results (+)	**1.39 (0.50, 2.28)**	**1.60 (0.53, 2.66)**	−0.96 (−7.13, 5.23)	0.55 (−2.22, 3.32)	1.50 (−1.49, 4.49)
Decided together (+)	0.55 (−0.13, 1.22)	0.40 (−0.39, 1.19)	0.31 (−4.04, 4.65)	−0.31 (−2.72, 2.09)	1.85 (−0.59, 4.30)
Lack of clarity (−)*	**−1.34 (−2.35, −0.34)**	−1.05 (−2.24, 0.14)	−3.97 (−10.09, 2.14)	−1.31 (−4.45, 1.83)	−2.49 (−6.22, 1.24)
Discrimination due to race/ethnicity (−)*	**−2.99 (−4.97, −1.01)**	−2.83 (−6.05, 0.39)	−3.19 (−9.76, 3.38)	0.005 (−5.30, 5.31)	−4.12 (−9.45, 1.22)
Disrespectful office staff (−)*	**−3.55 (−5.32, −1.78)**	−2.28 (−4.68, 0.13)	**−9.18 (−16.49, −1.87)**	−0.80 (−6.19, 4.59)	−2.21 (−7.35, 2.92)
Multivariable Models 2‡					
Compassion (+)	**3.12 (1.94, 4.31)**	**2.96 (1.60, 4.32)**	5.12 (−5.56, 15.79)	2.29 (−1.65, 6.23)	1.46 (−3.87, 6.79)
Elicited concerns (+)	**2.35 (1.18, 3.51)**	**3.23 (1.91, 4.56)**	2.97 (−12.63, 18.57)	0.19 (−3.28, 3.67)	0.07 (−5.29, 5.43)
Explained results (+)	**1.09 (0.12, 2.06)**	**1.61 (0.48, 2.75)**	−5.66 (−16.11, 4.80)	−0.73 (−3.69, 2.22)	−0.29 (−3.73, 3.16)
Decided together (+)	0.43 (−0.31, 1.16)	0.41 (−0.44, 1.26)	−4.98 (−12.24, 2.28)	0.75 (−2.13, 3.64)	0.35 (−2.68, 3.38)
Lack of clarity (−)*	−0.95 (−2.10, 0.19)	−0.94 (−2.26, 0.38)	0.38 (−10.70, 11.46)	−1.29 (−4.76, 2.18)	−2.92 (−8.04, 2.21)
Discrimination due to race/ethnicity (−)*	**−3.58 (−5.89, −1.27)**	**−4.52 (−8.10, −0.95)**	2.38 (−10.36, 15.11)	0.96 (−4.98, 6.91)	−3.20 (−11.39, 4.99)
Disrespectful office staff (−)*	**−3.39 (−5.38, −1.40)**	−1.48 (−4.10, 1.15)	−8.48 (−22.07, 5.11)	−0.09 (−6.08, 5.90)	−4.10 (−11.32, 3.12)

NOTE: Other patient race (n=52) excluded due to insufficient data

* Scoring in negative direction, higher scores indicate poorer patient-physician interaction

† Adjusted for covariates on Table 2 (patient factors)

‡ Adjusted for covariates on Table 2 and Table 3 (patient factors and physician factors)