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CLINICAL TRIAL

The impact of communication style on patient satisfaction

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Abstract

Background Communication between patients and health providers influences patient satisfaction, but it is unknown whether similarity in communication styles results in higher patient satisfaction.

Methods This study was conducted in the Smilow Cancer Hospital Breast Center. During routine follow-up visits, patients completed a Communication Styles Assessment (CSA), health survey (SF-12), Princess Margaret Hospital Satisfaction with Doctor Questionnaire, and brief demographic form. Physicians and Advanced Practice Providers were also asked to complete the CSA. Patients and providers were blinded to each other's responses. A communication styles concordance score was calculated as the Pearson correlation between 80 binary CSA items for each provider/patient pair. Factors affecting patient satisfaction scores were assessed in mixed-effects models.

Results In total, 330 patients were invited to participate; of these 289 enrolled and 245 returned surveys. One hundred seventy-four completed all survey components, and 18 providers completed the CSA. Among the factors considered, physical health score (effect size = 0.0058, 95% CI 0.00051 to 0.0011, $p = 0.032$) and employment status (0.12, 95% CI −0.0094 to 0.25, $p = 0.069$) had the greatest impact on patient satisfaction. However, patients who were not employed and less physically healthy had significantly elevated satisfaction scores when their communication style was more similar to their provider's (1.52, 95% CI 0.66 to 2.38, $p = 0.0016$).

Conclusions Patients who were physically healthy and employed were generally more satisfied with their care. The similarity in communication styles of patients and providers had a greater impact on patient satisfaction for patients who were less physically healthy and not employed.

Keywords Patient satisfaction · Communication styles · Breast cancer

Introduction

Clear communication is required for good medical care: patients need to fully understand their stage of disease, prognosis, and therapeutic options to make informed decisions about their healthcare. Communication is especially important in oncology given the complexity and toxicity of treatment [1]. Cancer patients who feel well-informed are more satisfied with their visits than those who feel that they lack sufficient knowledge about their disease [2].

Patient satisfaction also affects outcomes: patients who are more satisfied take greater interest in their care, report emergencies sooner, miss fewer appointments, retain health information better, and have better continuity of care [3].

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Increasingly, healthcare providers are being evaluated on patients' satisfaction questionnaires. This data is used to compare individual providers and departments, which may affect promotion, referrals, and fund allocation. Additionally, Medicare and other insurance providers have begun to link reimbursement to patient satisfaction [4, 5].

There are many factors that influence patient satisfaction, and some are beyond the control of the provider, such as patient age—patients under 45 tend to be less satisfied, health status—metastatic patients feel less supported, and financial status—patients with larger financial burden of treatment are less satisfied. However, providers have control over other important factors such as their own communication skills, which can be improved with training [3, 6–8].

Each provider and patient has unique communication preferences and different ways of giving and receiving information through verbal and non-verbal signals [8–11]. Most studies on personal communication styles originate from the business management, communications, and education fields [12–14]. Methods and tools, similar to those for personality type, have been developed for assessing personal communication style, which has been linked to test performance, job satisfaction, and team productivity. It is also now beginning to be explored in the medical field [11–14]. Healthcare providers' communication styles can have a large impact on patient satisfaction and function of interdisciplinary teams, but the communication style of the patient may play a role as well [15–18].

Previous studies have shown that certain provider communication styles result in higher patient satisfaction, but the dependence of this effect on the communication preferences of the patient has not been studied [15–17]. This study aims to determine if similarity between the communication styles of a patient and a provider increases patient satisfaction after controlling for demographic and health factors.

Methods

Subjects eligibility

All English-speaking, returning breast medical oncology and surgery patients were eligible. Patients were required to have had at least one prior visit with their provider to ensure that they were familiar with how their provider communicated. Patients were permitted to participate in the study only once. Those who saw multiple providers were asked to choose one provider for which to fill out the satisfaction questionnaire. This single site study was conducted at the Smilow Cancer Hospital Breast Center between 7/19/2017 and 5/9/2018. All breast medical oncologists, surgeons, and advanced practice practitioners (APP) working in the Breast Center were eligible to participate. The study protocol was approved by the Institutional Review Board of record at Yale University, and an informed consent form was provided to all participants prior to enrollment.

Survey components and scoring

The communication style of patients and providers was assessed using the Personal Coaching Style Inventory (PCSI). CoachWorks International created this tool to help business managers and consultants communicate more effectively. The assessment consists of eighty adjectives and phrases, organized into four groups of twenty items each. Each group corresponds to one of the following communication styles: Director (forward-thinking, aggressive leader), Presenter (friendly, lively, crowd pleaser), Mediator (warm, knowledgeable nurturer), and Strategist (methodical and diplomatic tactician). Several other widely used tools were studied to create the assessment. It was field tested for over 3 years and has since been used by over eighty thousand people and is available in seven languages [19, 20]. It was chosen for this study because it is both accessible and time-efficient. While it has been widely used in the business field, other studies within the medical field also have used it to improve multidisciplinary team dynamics [21]. In the standard scoring method, the group in which the participant selects the most traits is their dominant communication style [21]. To achieve greater granularity, all eighty traits on the assessment were compared for each provider and patient pair. A binary sequence was created for each participant by assigning selected items one and non-selected items zeros. A match score for each provider-patient pair was calculated as the Pearson's correlation coefficient of the two binary sequences (Supplemental Figure 1). This match score was used in all subsequent analyses.

Patient satisfaction was assessed using the Princess Margaret Hospital Satisfaction with the Doctor Questionnaire, which was developed and validated for use with oncology patients, with the permission of the developers [22]. It was chosen because it is widely used, disease-specific, and communication-focused. The standard scoring method for the Princess Margaret Hospital Satisfaction with the Doctor Questionnaire was used. Scores range from 1 to 4 with 4 denoting the best possible satisfaction [3, 22].

Health status was assessed with the Short Form-12 Health status survey, a general mental and physical health assessment. It was validated in the general US population and has been used within the field of oncology [23, 24]. The standard scoring system for the SF-12 Health Survey was used. Patients who failed to complete all twelve questions of the SF-12 were excluded from analyses that required a physical or mental health score. Higher scores indicated better health; the scoring system was designed to have an average score of about 50 and a standard deviation of 10 [25].

Basic patient demographic information was collected with an original questionnaire (Supplemental Figure 2) [3, 6–8]. The questionnaire assessed age, marital status, employment status, income, education level, and financial burden of treatment. Due to the relatively small study sample size, similar answer choices were combined so that each demographics question only had two groups for analysis purposes. This is described further in supplemental materials.

Survey distribution

Patients received survey packets at a regularly scheduled oncology visit. Patient surveys were anonymous; providers were given study ID's (PR01-PR18). Patients returned completed surveys to locked drop-boxes at the clinic exit. Patients who preferred to complete the survey at home were provided with pre-paid, addressed envelopes. Providers received study invitations and instructions via email and completed the communications styles assessment via the Qualtrics Survey platform [26].

Statistical analysis

The patient satisfaction scores of patients who share the same provider were expected to be more similar than patients from different providers. To account for this, a mixed effects multivariable linear regression analysis was performed. Such models also can adjust for variation in socioeconomic baseline characteristics of patients treated by different providers. Statistical details of the univariate and multivariable regression analyses are provided in supplemental materials.

Results

Study participants

Three hundred thirty eligible patients were invited to participate; 41 declined. Among the 289 patients who received a survey, 245 returned it and 174 completed all parts of the survey (Fig. 1). Two hundred eighty-seven participating patients were female and 2 were male; patient characteristics are shown in Table 1. The participating providers included seven breast medical oncologists, three medical

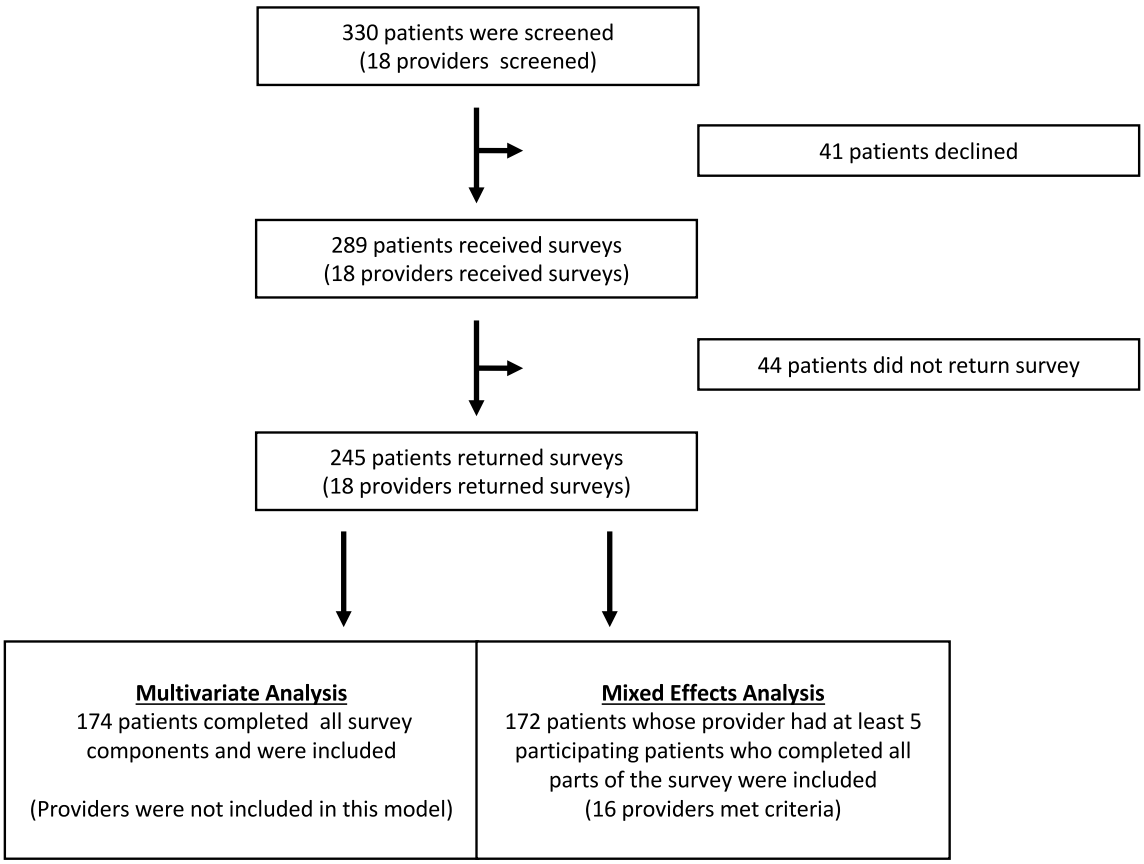

Fig. 1 Flow diagram for study recruitment, participation, and completion

Table 1 Patient demographic data collected with original questionnaire (Supplemental Figure 2)

Characteristic ($N=245$)	Participants (%)
Age (years)	
< 45	24 (10)
45–65	130 (53)
> 65	76 (31)
Missing	15 (6)
Marital status	
Married/equivalent	140 (57)
Single	88 (36)
Missing	17 (7)
Education level	
High school or less	32 (13)
More than high school	197 (80)
Missing	16 (7)
Employment status	
Full time	91 (37)
Part time/seasonal	29 (12)
Sick leave/disability	7 (3)
Unemployed/homemaker/student	34 (14)
Retired	65 (26)
Missing	19 (8)
Annual household income ($USD)	
< $30,000	33 (14)
$30,000–$50,000	28 (11)
$50,000–$75,000	32 (13)
> $75,000	108 (44)
Missing	44 (18)
Financial burden of treatment	
Not a burden	131 (54)
Yes a little bit of a burden	69 (28)
Yes, very much a burden	22 (9)
Missing	23 (9)

oncology nurse practitioners, five breast surgeons, and three breast surgical nurse practitioners. All providers completed the communication style assessment. One provider had no participating patients and was excluded from the analysis. Heatmap cluster analysis of provider PCSI responses showed some clustering of surgeons and Advanced Practice Providers, respectively (Supplemental Materials Figure 6). This clustering did not lead to any significant differences in match score by provider group by one-way ANOVA [$F(2,169)=2.25$, $p=0.11$].

The average patient physical and mental health scores were 45.5 (range 17.89 to 62.13) and 50.7 (range 17.35 to 66.54), respectively, and were similar to those reported in the SF-12 scoring manual [25]. The average patient satisfaction score was 3.68 (range 2.14 to 4.0), which was slightly higher than the scores reported in the survey's validation study [22]. The average patient-provider communication style match score was 0.13 and varied between provider-patient pairs (range −0.26 to 0.55). In total 68% of patients and providers fell into the Mediator communication style category, and therefore, a match solely based on dominant communication style would have provided a less nuanced view of this complex relationship (Supplemental Figure 1, Supplemental Table 1). Furthermore, based on our participants' responses, individual traits did not cluster tightly into the pre-assigned communication style groups indicating substantial diversity within the main four communication style categories (Supplemental Figure 3).

Determinants of patient satisfaction

In the linear mixed effects analysis, the match score was positively associated with patient satisfaction, but the trend did not reach significance (Table 2). The impact of match score on patient satisfaction varied considerably among providers (Supplemental Figure 4). This is illustrated by the considerable dispersion of individual patients around the provider-specific regression line. More information about the random effects calculated in this model is presented in supplemental materials.

We observed that higher physical health score was associated with significantly greater patient satisfaction score (effect size = 0.0058, 95% CI 0.00051 to 0.0011, $p=0.032$), and that lack of employment was borderline negatively associated with reduced patient satisfaction (0.12, 95% CI −0.0094 to 0.25, $p=0.069$) (Table 2).

Socioeconomic and physical health subgroup analysis

Physical health and employment seemed to be the two most important drivers of patient satisfaction. While subgroup analysis had not been predetermined, it provided an additional method of controlling for physical health and employment. The impact of the match score on patient satisfaction was different among subgroups with different physical health and employment statuses (Fig. 2). A mixed effects analysis for patients with low physical health that were not employed ($N=44$) was performed and showed that that greater match score significantly improved patient satisfaction in this group (1.52, 95% CI 0.66 to 2.38, $p=0.0016$). All factors except physical health and employment were included in this subpopulation mixed effects analysis (Table 2). Lower mental health score in this subset significantly correlated with greater patient satisfaction (−0.019, 95% CI −0.033 to −0.0055, $p=0.0076$); we cannot explain the reversal of this trend from the entire cohort analysis at this time. Age was also borderline significant in this analysis as well (0.26, 95% CI −0.014 to 0.53, $p=0.068$) (Table 2).

Table 2 Multivariable analysis using linear mixed effects model

	Estimate	Std. error	*p* value	95% CI
A. General patient population ($n=172$)				
Intercept	3.42	0.19	< 2e−16	3.05 to 3.79
Match score	0.22	0.21	0.34	−0.19 to 0.63
Physical health	0.0058	0.0027	0.032	0.00051 to 0.0011
Mental health	0.0015	0.0028	0.61	−0.0040 to 0.0070
Age (> 65 vs. < 65)	0.077	0.07	0.27	−0.060 to 0.21
Education (> high school vs. high school or less)	−0.093	0.083	0.27	−0.26 to 0.070
Employment (employed vs. not employed)	0.12	0.066	0.069	−0.0094 to 0.25
Income (> 30,000 vs < 30,000)	−0.025	0.085	0.77	−0.19 to 0.14
Marital (married vs. single)	0.015	0.058	0.79	−0.099 to 0.13
Financial burden (yes vs. no)	−0.12	0.091	0.2	−0.30 to 0.058
B. Low physical health and not employed ($n=44$)				
Intercept	4.18	0.35	3.63 E−13	3.49 to 4.87
Match score	1.52	0.44	0.0016	0.66 to 2.38
Mental health	−0.019	0.0069	0.0076	−0.033 to −0.0055
Age (> 65 vs. < 65)	0.26	0.14	0.068	−0.014 to 0.53
Education (> high school vs. high school or less)	0.031	0.16	0.84	−0.28 to 0.34
Income (> 30,000 vs < 30,000)	−0.05	0.15	0.75	−0.34 to 0.24
Marital (married vs. single)	−0.023	0.13	0.86	−0.28 to 0.23
Financial burden (yes vs. no)	−0.25	0.15	0.1	−0.54 to 0.044

Estimates of fixed effects generated by linear mixed effects model. Random effects, multivariable, and univariate results are presented in Supplemental Tables 1, 2 and 3, respectively. Mixed effects models were fit with the R package lme4. Standard errors for the fixed effects were estimated using the Satterthwaite approximation for the degrees of freedom, as implemented in lmerTest

Discussion

Good patient and provider communication is important for achieving optimal health outcomes and has an important effect on patient satisfaction [3, 4]. In our study, patient satisfaction increased with communication style similarity but this trend did not reach statistical significance for the entire study population. However, in patients who have lower physical health and less socio-economic support, we found that greater similarity in communication styles between provider and patient significantly increased satisfaction. These results suggest that communication coaching and tailoring communication to match the patient's communication style could improve patient satisfaction, particularly among patients who are most in need due to their lower physical health status [27]. Communications style training, which is commonly used in business, could allow providers to consciously adjust their communication practices from their innate communication style to better match their patient's preferences [28].

Physical health and economic status were the primary drivers of patient satisfaction for the entire cohort highlighting that many factors other than communication influence patient satisfaction. Physical health status is a well-documented major factor impacting patient satisfaction [7, 8]. Socioeconomic factors are also known to influence patient satisfaction [29, 30]. Patients who were employed full time, part time, or were on sick leave or disability, had higher patient satisfaction than those who were unemployed or retired. Employment status is likely linked to the comprehensiveness of health insurance coverage and financial burden of care [31–34]. These findings suggest that considering treatment associated financial burden during medical decision making could also have a positive impact on satisfaction.

An important limitation of our study is that it was conducted at a single academic institution with providers and patients representing one disease (breast cancer). Therefore, the findings may not be applicable to other practice settings or different types of cancers or diseases. While differences in patient demographics between academic and community practices exist, our patient population was reasonably large and included a broad range of demographics. Our patient population was predominantly female and the extent to which our findings apply to male patients remains to be determined. During the study, providers sometimes asked us to skip patients who were getting bad news and invite them to participate at later clinic visit. Complying with this request might have biased upwards the overall patient satisfaction scores, as patient attitudes toward providers may have dropped during difficult visits where bad news was given. However, it is important to note that many of those patients were asked to participate at subsequent visits once

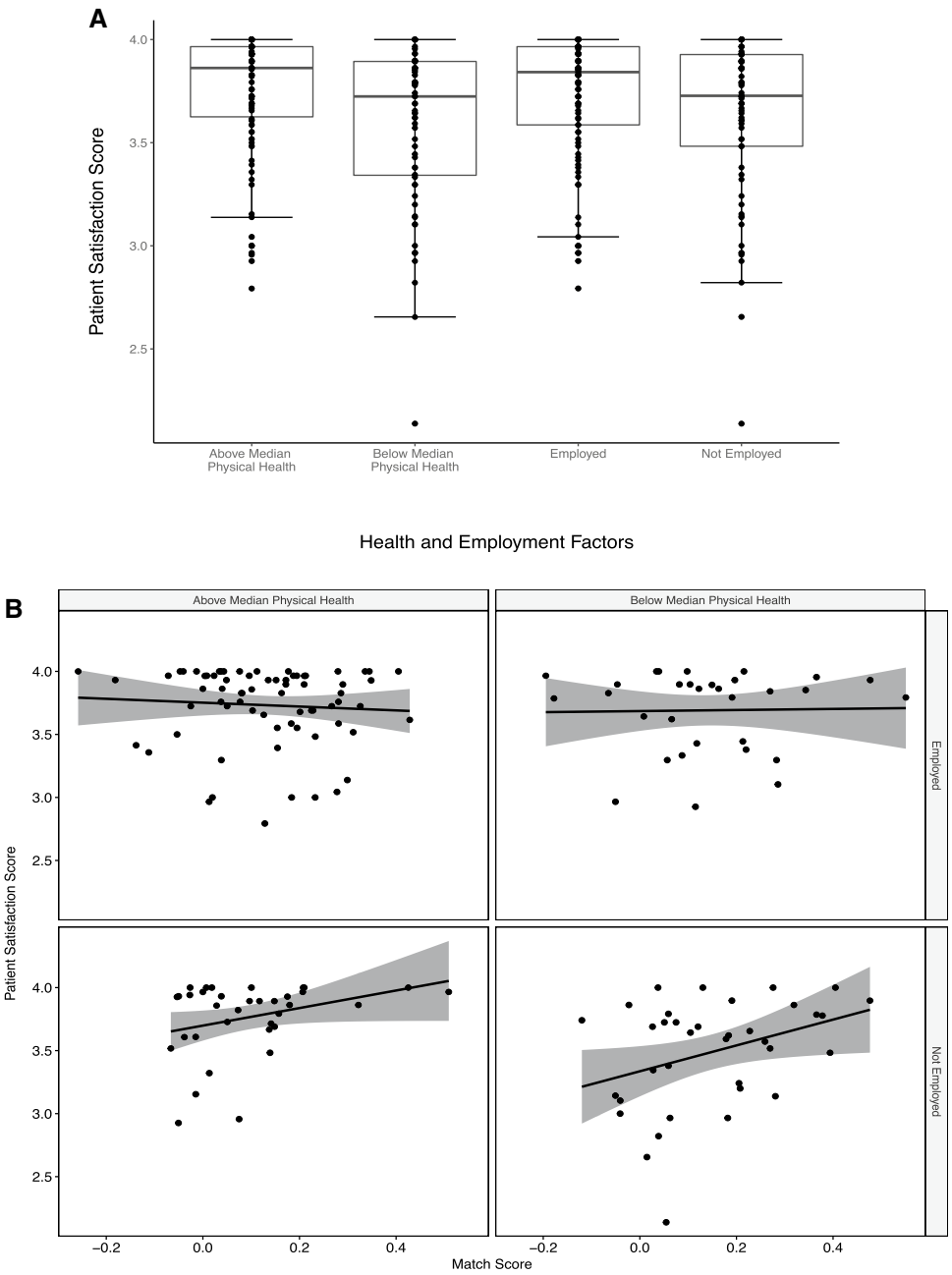

Fig. 2 **a** Patient satisfaction score within groups defined by physical health and employment status, which were found to be significantly associated with patient satisfaction in the multivariable analysis. Physical health scores were median dichotomized to create two groups. Full-time, part-time, and sick leave/disability were considered employed; unemployed/student/homemaker, retired were considered not employed. **b** Effect of patient provider communication style match on patient satisfaction in patient subgroups defined by physical health status and employment status dichotomized as above. Points are individual patients, line is the regression line, and the gray area represents its 95% confidence interval

they had time to process their news. Adjusting the sampling in this way may have biased results by inflating patient satisfaction scores; however, it was important to be sensitive to our patients' needs. Furthermore, excluding patients with poorer diagnoses entirely may biased our results more than adjusting the time of collection. During the conduct of the study, we also emphasized to participants that we would like to learn their overall satisfaction with their provider's communication rather than their satisfaction with the particular visit. Patients were surveyed at different points in their cancer treatment some during active treatment others in long-term follow-up. This affect the number of previous visits that a patient had with their provider, some patients had only one or two visits others had known their provider for years, and the patient's acceptance of their diagnosis and treatment options. We did not collect data on the on the number of visits with a provider as patients' recall was not accurate given the multiple care team members and in some cases multiple years of treatment. We acknowledge that this is a limitation as the variation in number of visits with a provider likely impacted patients' ability to judge satisfaction with provider communication. We also recognize that our choice of survey instruments can influence results. While we hypothesize that a study conducted with other valid tools

would yield similar results, other instruments may highlight different aspects of the provider-patient communication. In this study, we used a communication style assessment tool that is primarily used in executive coaching. Within this field, there are multiple communication style frameworks with different communication style groups. Also, the communications styles assessment included only one response option (a checkmark) per trait; this design and the accompanying instructions were part of the original CoachWorks International tool and were not altered for this study. When participants did not check off a trait, it was assumed that the lack of checkmark was an active choice not to identify with the trait. However, with only one response option the absence of a check could also have been due to an accidental oversight or omission. Our study focused on communication, but we recognize that many other elements that we did not measure including facility cleanliness, office ambience, ease of access, reputation and appointment wait times also influence overall patient satisfaction with care [35–38].

In summary, we found that patient physical health and employment status have the largest impact on patient satisfaction. The similarity in communication style between provider and patient appears to affect patient satisfaction and has the largest impact in patients with poorer physical health and in more challenging socioeconomic situations. Training health care providers to discern a patient's communication style and tailor their communication to match the patient's preference could prove beneficial for improving patient satisfaction. Adding a communication styles assessment to existing patient satisfaction quality metrics may help providers better understand their existing scores and adjust their communication to meet the needs of their patients.

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Compliance with ethical standards

Conflicts of interest Dr. Mougalian is a consultant for Eisai Pharmaceuticals and Puma Biotechnology. Dr. DiGiovanna receives remuneration from DAKO and NeoMarkers and consultants for Merck. Dr. Silber receives remuneration from AstraZeneca. Dr. Adelson is a consultant for Celgene, Roche, and Heron Therapeutics. Dr. Killelea is a consultant for Genentech. All other authors declare that they have no conflicts of interest.

Research involving human or animal participants All procedures performed in studies involving human participants were in accordance with the ethical standards of the Yale Institutional Review Board and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed consent Informed consent was obtained from all individual participants included in the study.

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