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Clinician empathy is associated with differences in patient-clinician communication behaviors and higher medication self-efficacy in HIV care

Tabor E. Flickinger, MD, MPH[1,*], **Somnath Saha, MD, MPH**[2,3], **Debra Roter, DrPH**[4], **P. Todd Korthuis, MD, MPH**[3], **Victoria Sharp, MD**[5], **Jonathon Cohn, MD, MHS**[6], **Susan Eggly, PhD**[6], **Richard D. Moore, MD, MHS**[4], and **Mary Catherine Beach, MD, MPH**[4]

[1]University of Virginia School of Medicine, Charlottesville, VA, USA

[2]Portland VA Medical Center, Portland, OR, USA

[3]Oregon Health and Science University, Portland, OR, USA

[4]Johns Hopkins University, Baltimore, MD, USA

[5]St. Luke's Roosevelt, New York, NY, USA

[6]Wayne State University, Detroit, MI, USA

Abstract

Objective—We examined associations of clinicians' empathy with patient-clinician communication behaviors, patients' rating of care, and medication self-efficacy.

Methods—We analyzed 435 adult patients and 45 clinicians at four outpatient HIV care sites in the United States. Negative binomial regressions investigated associations between clinician empathy and patient-clinician communication, assessed using the Roter Interaction Analysis System (RIAS). Logistic regressions investigated associations between clinician empathy and patient ratings of clinician communication, overall satisfaction, and medication self-efficacy.

Results—Clinicians in the highest vs. lowest empathy tertile engaged in less explicitly emotional talk (IRR 0.79, $p<0.05$), while clinicians in the middle vs. lowest engaged in more positive talk (IRR 1.31, $p<0.05$), more questions (IRR 1.42, $p<0.05$), and more patient activating talk (IRR 1.43, $p<0.05$). Patients of higher empathy clinicians disclosed more psychosocial and biomedical information. Patients of clinicians in both the middle and highest (vs. lowest) empathy tertiles had greater odds of reporting highest medication self-efficacy (OR 1.80, 95% CI 1.16–2.80; OR 2.13, 95% CI 1.37–3.32).

[*]Corresponding Author: University of Virginia School of Medicine; Division of General, Geriatric, Palliative and Hospital Medicine; PO Box 800901, Charlottesville, VA 22908, USA. Tel.: 434-924-5608; Fax: 434-924-1138.

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Conclusions—Clinician empathy may be expressed through addressing patient engagement in care, by fostering cognitive, rather than primarily emotional, processing.

Practice Implications—Clinicians should consider enhancing their own empathic capacity, which may encourage patients' self-efficacy in medication adherence.

Keywords

HIV/AIDS; patient-clinician communication; empathy; self-efficacy; medication adherence

1. Introduction

Empathy is defined as a primarily cognitive attribute that involves understanding someone else's emotions and experiences and, in the context of clinical care, a capacity to communicate this understanding, with the intention of helping to alleviate pain or suffering [1]. Empathy is widely considered to be an important component of effective patient care [1–6], allowing clinicians to better understand the emotions and perspectives of patients [7]. Empathy can manifest as behaviors in interpersonal interactions and can be perceived by patients [8, 9]. Empathic communication behaviors by clinicians have been associated with higher patient satisfaction [10–12], better control of patients' symptoms [13], and better patient compliance with medical regimens [14]. Clinicians who use more empathic communication are able to elicit more relevant information from patients about their illnesses and concerns [15].

In chronic disease, clinicians need to support patients as they engage in self-management and adhere to medications. In diabetes care, clinician empathy has been associated with objective measures of disease management such as blood sugar control and fewer complications of diabetes [16, 17]. Empathic communication has also been shown to increase patients' cancer-related self-efficacy and sense of control [18]. When primary care patients rate their clinicians as having higher empathy, they demonstrate better adherence to recommended treatment. This effect of empathy on patient adherence appears to be mediated by the development of interpersonal trust and a therapeutic partnership between clinicians and patients [19]. It may also be that clinicians who exhibit more empathic communication are able to create more effective partnerships with patients, providing patients with the understanding and confidence necessary to take active roles in disease management and thus, achieving more favorable disease outcomes.

Advances in HIV care have transformed a fatal illness into a potentially manageable chronic disease. In order to achieve the benefits of reduced morbidity and mortality, strict medication adherence is required [20]. The context of HIV care can offer unique challenges, complicated by patients' perceived stigma and discrimination, barriers to trust, healthcare disparities, and co-morbidities of mental health and substance use [21–23]. Effective patient-clinician relationships appear to help patients overcome these challenges and achieve positive outcomes. High-quality interactions with clinicians improve HIV medication adherence [24, 25], satisfaction with care and health-related quality of life [26]. A general measure of relationship quality, feeling known as a person, is associated with better adherence and HIV viral suppression [27]. Qualitative studies have also demonstrated the

perceived importance of compassionate clinicians in supporting adherence for People Living With HIV/AIDS (PLWH) [28].

Although positive patient-clinician relationships appear to promote improved outcomes in HIV care, a specific link between clinician empathy and outcomes has not yet been demonstrated in this context. Furthermore, studies in other contexts (such as oncology and diabetes care) which support the concept of clinician empathy in promoting self-management, have not linked clinician empathy to observed communication behaviors addressing both the cognitive and emotional needs of patients. The purpose of our study was to assess the associations of HIV clinicians' empathy with patient and clinician communication behaviors, patients' rating of care (clinician communication style and overall satisfaction), and medication self-efficacy. We hypothesized that clinicians' empathy would be associated with more positive patient experience of care and higher medication self-efficacy. We also hypothesized that clinician empathy would be associated with observed clinicians' socio-emotional communication (that facilitates emotional processing) as well as communication that fosters active patient engagement and self-management.

2. Methods

Study Design, Subjects, and Setting

We conducted a cross-sectional analysis of data from the Enhancing Communication and HIV Outcomes (ECHO) Study, which was designed to assess possible racial/ethnic disparities in communication in HIV care and to determine which characteristics of interpersonal process are associated with more positive outcomes among patients with HIV [29–33]. Study subjects were HIV clinicians and patients at four HIV care sites in the United States (Baltimore, Detroit, New York, and Portland). The study received IRB approval from each of the four sites. Eligible clinicians were physicians, nurse practitioners, or physician assistants who provided primary care to HIV-infected patients at one of the study sites. Eligible patients were HIV-infected, age greater than 18, English-speaking, and had had at least one prior visit with their clinician.

Data Collection Methods

HIV clinicians who agreed to participate gave informed consent and completed a questionnaire. Research assistants then approached patients of participating clinicians in the waiting rooms, with the goal of enrolling 10 patients per clinician. After patients gave informed consent, including the audio-recording of their clinic visit, research assistants placed a digital audio-recording device in the examination room to record the patient-clinician encounter. Following the patient-clinician encounter, patients completed a one-hour interview with trained research assistants to gather data on demographic, social, and behavioral characteristics, as well as patient ratings of care and medication self-efficacy. Finally, research assistants abstracted clinical data, such as HIV viral loads, from patients' medical records.

Main Measures

Clinician Empathy—Our independent variable was clinician self-rated empathic engagement, measured on the clinician questionnaire. We measured empathic engagement using the Turknett Leadership Group, Emotional Intelligence Quiz [34]. Emotional intelligence refers to the capacity to assess, interpret, and manage emotions and is required for the development of empathic perspective-taking and its use as a social competence [35, 36]. Emotional intelligence can thus be understood as the clinician's inherent ability to be attuned to the emotions of others, which is then made evident through the expression of empathy for others. This scale was selected to measure the empathic *experience* of the clinician, rather than other self-report scales which focus on attitudes towards empathy [37, 38]. In this scale, empathy is not necessarily confined to interactions with patients or in clinical practice but includes the role of empathy in a range of situations in daily life. This scale contains 14 items, and examples of items are "I often have tender, concerned feelings for people less fortunate than me," "I am often quite touched by things that I see happen," "Before criticizing someone, I try to imagine how I would feel if I were in their place," and "When I see someone taken advantage of, I feel kind of protective towards them." Possible responses are on a 5-point Likert scale and are anchored between 'describes me very well' (5) and 'does not describe me very well.'(1) Higher scores represent higher levels of empathy.

Audio Recorded Measures of Patient and Clinician Communication—Audiotapes were analyzed using the Roter Interaction Analysis System (RIAS), a widely used coding system to assess patient and clinician communication behaviors during medical encounters with well-documented reliability and predictive validity [39–42]. RIAS analysts assign one of 37 mutually exclusive and exhaustive categories to each complete thought expressed by either the patient or clinician (referred to as an utterance). Four broad types of exchange can be assessed by combining these categories to reflect socio-emotional communication (including explicitly emotional talk such as empathy and concern, positive talk including agreements, approvals and compliments, negative talk such as criticisms and disagreements, and social chit-chat), information-giving (including biomedical and psychosocial/lifestyle information), question-asking (including open-ended and closed-ended questions), and patient activation (such as asking for the others' opinions, confirming the others' understanding, or clarifying one's own understanding and cues of interest). Higher scores represent more frequent occurrence of each type of communication behavior.

In addition, the RIAS provides global ratings of the patient and clinician emotional tone. Ratings of emotional tone are performed using full audio voice files, not content-filtered speech (i.e., isolated vocal tone). Emotional tone scores are calculated by summing coders' subjective ratings for patients and clinicians (separately) on several dimensions. The *patient emotional tone* is the sum of coders' ratings of patient dominance/assertiveness, friendliness/warmth, responsiveness/engagement, and sympathy/empathy exhibited by the patient during the encounter. The *clinician emotional tone* is the sum of coders' ratings of clinician's interest/attentiveness, friendliness/warmth, responsiveness/ engagement, sympathy/empathy, and the degree to which the clinician was hurried/rushed (reverse coded). Higher scores represent more positive emotional tone, with a range of 1 to 6 on each dimension. All coding

was performed by the same two coders and inter-coder reliability, calculated on a random sample of 41 audio-files, was greater than 90% agreement in each of the domains. The coders were two white women, one with five years of RIAS coding experience and the other with 20 years.

We hypothesized that higher clinician empathy would be associated with communication behaviors that can facilitate emotional processing: socio-emotional talk (which includes positive talk and emotional talk), psychosocial information-giving, and positive emotional tone. We also hypothesized that higher clinician empathy would be associated with communication behaviors that can facilitate cognitive processing: question-asking, biomedical information-giving, and patient activation.

Patient-Reported Outcomes—Dependent variables in our analysis included (1) patient ratings of clinician communication, (2) patient overall satisfaction, and (3) patients' medication self-efficacy, all derived from patients' post-encounter interviews. For all three of these measures, higher scores represent more positive outcomes. We measured patient ratings of clinician communication using the Interpersonal Processes of Care Instrument's general communication subscale, [43] which consists of 21 items reflecting communication clarity and comprehensiveness (Cronbach's alpha 0.88). Possible responses were on a 5-point scale between always and never. We measured overall satisfaction with the question, *"Overall, how would you rate the quality of medical care you have received in the past 6 months?"* Possible responses were on a 5-point scale ranging between excellent and poor. We measured medication self-efficacy with a scale developed by Shively and colleagues, which includes 6 items indicating extent to which the patient feels capable of following medication regimens [44]. For example, patients are asked, *"How sure are you that you can take your prescription medications at the appropriate timing?"* Possible responses were on a 10-point scale ranging between 'totally sure' and 'not at all sure.' The scale had high internal consistency (Cronbach's alpha 0.93).

Covariates—Patient interviews also provided patient socio-demographic information (age, sex, employment, education, and drug use). Drug use was assessed using questions from the Addiction Severity Index [45]. Active drug use was defined as any use of heroin or cocaine, or use of amphetamine, methadone, opiates or marijuana without a prescription in the past 30 days. Clinician questionnaires provided demographic information such as age, sex, and main race/ethnicity.

Analysis

We conducted our analysis in three stages. First, we used descriptive statistics to explore and describe the characteristics of our study sample. We examined the distribution, means, and internal consistencies of the empathy scale. Based on the non-normal distribution of the empathy scores, we created tertiles to compare low, medium, and high levels of this clinician trait. Based on the positive skew in the distribution of all patient-rated outcome variables, we dichotomized patient ratings of communication quality (at the median score), overall satisfaction (excellent vs. all other responses) and medication self-efficacy (highest score vs. all others). We then performed t-tests for continuous variables and chi-squared tests for

categorical variables to assess patient and clinician characteristics (covariates) which may be associated with clinician empathy.

We used negative binomial regression to compare patient and clinician communication behaviors by tertiles of clinician empathy. Because one of the four study sites had more than one clinician interacting with the patient which was captured in the RIAS analysis (e.g. nearly all patient visits at that site started with an interaction with a nurse or nurse practitioner and then was followed by the primary HIV provider), it was impossible to distinguish which RIAS communication behaviors were related to the primary HIV clinician whose empathy we had assessed. Therefore, we restricted the analysis examining the associations of clinician empathy with communication behaviors to data obtained from the other three sites. Values are reported as Incidence Rate Ratios (IRR) for counts outcomes, meaning that higher values (greater than 1) indicate more frequent use of the particular communication behavior with an increase in clinician empathy score.

We used logistic regression to compare patient ratings of clinician communication, satisfaction, and medication self-efficacy by tertiles of clinician empathy. Data for this analysis came from all four sites. In multivariate analyses, we adjusted for site and accounted for nested clustering of patients within clinicians using generalized estimating equations. Values are reported as Odds Ratios (OR) for dichotomous outcomes, meaning that higher values (greater than 1) indicate a greater likelihood of having the outcome (i.e. reporting the highest level of medication self-efficacy versus less-than-highest levels) with an increase in clinician empathy score.

All regression analyses were adjusted for practice site and accounted for clustering of patients within clinicians. Adjustment for patient and clinician characteristics was not performed, because these covariates were not significantly associated with clinician empathy in bivariate analyses and did not appear to confound the associations evaluated between clinician empathy and communication behaviors or outcomes. Analyses of medication self-efficacy were restricted to those patients who were receiving ART. All analyses were conducted using Stata Version 11.0 (College Station, TX: StataCorp LP).

3. Results

Study Sample

There were 55 clinicians eligible for the study across all sites, and 45 (82%) agreed to participate. Only 2 clinicians refused (one due to discomfort with audio-recording and the other due to time constraints). The remaining clinicians were not enrolled because we had reached our enrollment target. Across all sites, we identified 617 eligible patients. Clinicians refused to allow 18 patients to be approached for the study. Reasons for refusal was that the clinician felt too rushed (n=12), the patient may be too sick (n=5) and the patient was returning for lab results and not a complete visit (n=1). Of the remaining 599 patients, 435 (73%) agreed to participate and completed all study procedures. Of the 164 patients who declined to enroll in the study, the most common reasons were that they did not have time to complete the interview (n=106), were not feeling well (n=22), and were not interested in studies (n=13).

Association of Clinician Empathy with Patient or Clinician Characteristics

Patient and clinician characteristics are shown in Table 1. Patients were mostly African American (58%) and white (24%); 34% were women, 73% had a high school degree, and 29% were actively using drugs. Most patients were on antiretroviral therapy (79%). Clinicians were mostly white (67%) and Asian (24%); 56% were women.

Empathy scores for clinicians ranged from 2.93 to 5.00 (from a possible range of 1–5, with higher scores representing higher empathy) with a mean of 4.12 overall. Means in each tertile were 3.62 for the low empathy tertile, 4.08 for the middle, and 4.65 for the high. Cronbach's alpha for the empathy scale was 0.82.

Among the 435 patients, there were no patient demographic characteristics (e.g. patient age, gender, education, or active drug use) that were associated with clinician empathy. Regarding clinical characteristics, patients of clinicians with the highest empathy were more likely than those in the middle or lowest tertiles to be receiving ART (85% versus 73% and 79% respectively, $p=0.048$). However, there were no significant differences in CD4 counts or in viral suppression among those on ART, by clinician empathy. Among the 45 clinicians, there were no clinician characteristics (e.g. sex, age, clinician type, or main racial/ethnic group) that were associated with clinician empathy.

Association of Clinician Empathy with Patient-Clinician Communication

Associations of clinician empathy with clinician and patient communication behaviors are shown in Table 2. Compared to clinicians in the lowest tertile of empathy, those in the middle tier engaged in more positive talk (IRR 1.31, $p<0.05$), asked more questions (IRR 1.42, $p<0.05$), and engaged in more patient activating talk (IRR 1.43, $p<0.05$). Their patients, in turn, gave more information to their clinicians in both the psychosocial (IRR 1.40, $p<0.05$) and biomedical (IRR 1.49, $p<0.001$) realms. Clinicians in the highest vs. lowest empathy tertile engaged in 20% less explicitly emotional talk (IRR 0.79, $p<0.05$), and their patients gave more biomedical information (IRR 1.35, $p<0.01$). There were no significant differences in patient or clinician communication behaviors when comparing clinicians in the high vs. middle empathy tertiles. There were no differences based on clinician empathy in the clinician's emotional tone or clinician information-giving.

Association of Clinician Empathy with Patient-Reported Outcomes

Associations of clinician empathy with patient ratings of communication, satisfaction, and medication self-efficacy are shown in Table 3. There was no association between clinician empathy and patient ratings of communication or overall satisfaction. Patients of clinicians in both the middle and highest (vs. lowest) tertile of empathy had greater odds of reporting highest medication self-efficacy (OR 1.80, 95% CI 1.16–2.80 for middle; OR 2.13, 95% CI 1.37–3.32 for highest). When analysis was restricted to patients on ART, similar results were seen (OR 1.76, 95% CI 1.10–2.81 for middle; OR 1.59, 95% CI 1.02–2.46 for highest). There were no significant differences in patient experience or medication self-efficacy between clinicians in the high and middle empathy tertiles.

4. Discussion and Conclusion

4.1 Discussion

Patients coping with complex illness have a need to understand, through cognitive processing of biomedical or therapeutic information, and a need to be understood, through emotional connections with their clinicians. Although clinician empathy has traditionally been framed as a sensitivity to the emotions of others, recent work in oncology has sought to integrate clinicians' empathic engagement with patients' informed decision-making and action in managing their conditions [46, 47]. Our findings suggest that this model may also be applicable to HIV care. Clinician empathy may be expressed through addressing patient engagement in care and involving patients more effectively in self-management. Highly empathic clinicians expressed *less* explicit emotion than others and clinicians who scored in the middle range engaged in more patient activating talk and asked more questions of their patients than low empathy clinicians. The patients of higher empathy clinicians disclosed more information to them than to low empathy clinicians, in both the biomedical and psychosocial realm. We also found that clinician empathy was independently associated with higher medication self-efficacy for patients. This is a particularly important goal in HIV care, in which strict medication adherence is necessary to achieve reduced morbidity and mortality.

Clinicians' use of patient activation strategies in the form of asking for patient opinion and clarifying understanding may facilitate patients' self-management. These findings are consistent with those of a previous study in which genetic counselors' use of patient activation strategies were related to evidence of cognitive processing and the generation of insight by simulated patients [48]. Cognitive processing is necessary for problem-solving and overcoming barriers to adherence, which could contribute to higher medication self-efficacy. A prior study of missed opportunities for empathy in HIV care found that many emotional cues from patients were addressed with problem-solving, as clinicians focused on the problems triggering the emotions rather than solely on the emotions themselves [49].

The associations between clinician empathy and patient and clinician communication behaviors in our study do not appear to follow a linear relationship. Clinicians with empathy in the middle group appeared to be more engaged and engaging with their patients than those in the lowest group, demonstrating more positive talk, more question–asking, more patient activation statements, and eliciting more psychosocial and biomedical information-giving from patients. These behaviors can facilitate both emotional processing (positive talk, psychosocial information-giving) and cognitive processing (question-asking, patient activation, biomedical information-giving). Although we might expect the high empathy group to demonstrate even more of these behaviors, their interactions were in fact more biomedically focused, with less emotional talk and more patient biomedical information-giving. These findings could imply that higher clinician empathy is not necessarily better, if the middle group demonstrated the most "positive" communication behaviors from a socio-emotional standpoint. However, the communication behaviors of the high empathy group may be well suited to promoting patient self-management in the context of HIV care, with more clinician and patient attention focused on cognitive rather than emotional processing.

Ultimately clinician empathy was associated with higher medication self-efficacy in both the middle and high empathy groups, as compared to low empathy clinicians.

More longitudinal examination is needed to establish the potential impact of clinician empathy on patient and clinician communication behaviors and patient outcomes. In this cross-sectional study, it is not possible to demonstrate directions of effect or to account for the reciprocal nature of patient-clinician interactions. However, if clinician empathy does indeed improve communication in clinical encounters and help patients achieve better outcomes, efforts to enhance empathy among clinicians will continue to gain interest. Interventions to train more empathic clinicians are already being investigated in medical education [50]. These interventions most commonly use narrative or creative arts to encourage understanding of patient emotions and perspectives. In addition, communication skills training seeks to improve the recognition of patient emotional cues and the expression of empathy during encounters. While many studies of empathy focus on emotional processing, attention to the patients' cognitive needs may also be required, in order to help patients move to the next steps and take action in managing their conditions [46, 47]. Strategies for empathic clinicians to engage patients in effective self-management could be particularly relevant in conditions such as HIV, which demand sustained behavior change from patients to achieve positive outcomes.

Our study has several limitations. First, empathy measurement may be subject to social desirability bias. Despite this, we found a range of responses across the scale. Future studies using observer judgment of clinician empathy, correlated with clinician self-report, may be useful in addressing this possibility of bias. Second, there may be unmeasured clinician characteristics which confound the associations we observed. Third, patients and clinicians in our study knew that they were being recorded and may have attempted to communicate differently, which may have biased our study toward more favorable observed communication behaviors. Prior studies, however, have not found that recorded visits were substantively different from non-recorded ones. [51, 52] Fourth, as in many studies, patient ratings of satisfaction and clinician communication were highly skewed and showed restricted variance, limiting the power of the study to demonstrate relationships between these variables and clinician empathy. Finally, the study sample was from four urban, academic sites across the United States and took place in the context of HIV care, which perhaps limits the generalizability of the results.

4.2 Conclusion

In conclusion, clinician empathy may influence HIV-positive patients' medication self-efficacy through communication that fosters cognitive rather than emotional processing. We do not suggest that socio-emotional communication is unimportant as prior evidence has shown that it does improve patient outcomes such as trust and therapeutic rapport. Our findings that there was less emotional talk, and more relative biomedical compared to psychosocial talk, in visits with the highest empathy clinicians were surprising. Therefore, further studies should investigate these associations across different settings so that we can fully understand how emotional engagement on the part of clinicians affects communication.

4.3 Practice Implications

Practicing clinicians should consider the benefits of enhancing their own empathic capacity, which may promote emotional connections with patients and also encourage patients' self-efficacy in medication adherence. Further research should explore the effectiveness of interventions designed to enhance clinician empathy and its possible impact on communication, patients' engagement in care and medication adherence behaviors.

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Highlights

- We studied links between empathy, communication, and medication self-efficacy
- We analyzed visits between 435 patients and 45 primary HIV care providers
- Higher empathy clinicians used a more positive and activating communication style
- Patients of higher empathy clinicians disclosed more information to them
- Patients of higher empathy clinicians had higher medication self-efficacy

Table 1

Characteristics of Study Sample, by Clinician Empathy Tertile

		Clinician Empathy Tertile			
Patient Characteristics *Demographic/Clinical Characteristics*	**Total (N=435 Patients)**	**Low (n=147)**	**Middle (n=154)**	**High (n=133)**	**p-value**
Age, Mean (SD)	45.4 (9.4)	45.5 (9.3)	44.2 (9.6)	46.6 (9.4)	0.223
Female, n (%)	147 (34)	53 (36)	52 (34)	42 (32)	0.732
High school degree, n (%)	317 (73)	99 (67)	115 (74)	103 (76)	0.206
Race/Ethnicity					0.393
Black, n (%)	254 (58)	95 (64)	81 (52)	78 (58)	
Hispanic, n (%)	62 (14)	18 (12)	23 (15)	21 (16)	
White, n (%)	106 (24)	31 (21)	43 (28)	32 (24)	
Active drug use, n (%)	128 (29)	44 (30)	50 (32)	34 (25)	0.409
On antiretroviral therapy (ART), n (%)	334 (79)	114 (79)	109 (73)	111 (85)	0.048
Patient-Reported Outcomes					
Clinician communication rating, above median, n (%)	212 (49)	71 (48)	81 (52)	60 (44)	0.413
Overall satisfaction, excellent, n (%)	269 (62)	88 (60)	105 (68)	76 (57)	0.128
Medication Self-efficacy, highest score, n(%)	137 (32)	36 (25)	53 (35)	48 (37)	0.059
Clinician Characteristics	**Total (N=45 Clinicians)**	**Low (n=15)**	**Middle (n=15)**	**High (n=15)**	
Age, Mean (SD)	44.5 (8.6)	43.3 (9.2)	46.7 (7.5)	43.4 (9.0)	0.191
Female, n (%)	25 (56)	6 (40)	9 (60)	10 (67)	0.310
Race/Ethnicity					0.482
White, n (%)	30 (67)	9 (60)	10 (67)	11 (73)	
Asian, n (%)	11 (24)	4 (27)	5 (33)	2 (13)	

		Clinician Empathy Tertile			
Other, n (%)	4 (9)	2 (13)	0 (0)	2 (13)	
Physician, n (%)	34 (76)	10 (67)	10 (67)	14 (93)	0.146

Table 2

Differences in observed measures of patient-clinician communication based on clinicians' self-reported empathy [1]

	EMPATHY TERTILE [2]	
	Middle [3] IRR (95% CI)	High [3] IRR (95% CI)
Clinician Behaviors		
Emotional tone	1.01 (0.97–1.06)	0.99 (0.94–1.03)
Socio-emotional talk	1.14 (0.90–1.44)	1.02 (0.85–1.23)
Positive talk	**1.31 (1.01–1.71)** *	1.24 (0.98–1.59)
Emotional talk	0.97 (0.74–1.27)	**0.79 (0.63–0.99)** *
Question-asking	**1.42 (1.02–1.97)** *	1.15 (0.84–1.57)
Information-giving/counseling	1.12 (0.87–1.44)	0.95 (0.80–1.14)
Psychosocial	1.21 (0.71–2.05)	1.00 (0.70–1.43)
Biomedical	1.11 (0.88–1.39)	0.95 (0.78–1.14)
Patient Activation	**1.43 (1.03–1.99)** *	1.30 (0.98–1.71)
Patient Behaviors		
Emotional tone	1.02 (0.99–1.04)	1.01 (0.98–1.04)
Socio-emotional talk	1.19 (0.99–1.43)	1.05 (0.87–1.27)
Question-asking	1.06 (0.84–1.34)	1.07 (0.83–1.37)
Information-giving	**1.45 (1.23–1.71)** ***	**1.26 (1.02–1.54)** *
Psychosocial	**1.40 (1.01–1.95)** *	1.13 (0.83–1.54)
Biomedical	**1.49 (1.27–1.74)** ***	**1.35 (1.08–1.68)** **
Patient Activation	0.92 (0.73–1.17)	0.98 (0.76–1.28)

[1] Data from 3 sites;

* p<0.05,

** p<0.01,

*** p<0.001

[2] p-values and incidence rate ratios (IRR) obtained using negative binomial regression and GEE to account for clustering of patients within clinicians, adjusting for site. Higher values (greater than 1) indicate more frequent use of the particular communication behavior with an increase in clinician empathy score.

[3] Low is reference category

Table 3

Patient Evaluation of Care and Self-Management, by Clinician Empathy [1]

	EMPATHY TERTILE [2]	
	Middle [3] OR (95% CI)	**High [3] OR (95%CI)**
Clinician communication rating, above median	1.22 (0.74–2.01)	0.88 (0.53–1.47)
Overall satisfaction, excellent	1.43 (0.78–2.58)	0.95 (0.52–1.71)
Medication Self-efficacy, highest score	**1.80 (1.16–2.80)** **	**2.13 (1.37–3.32)** **

[1] Data from 4 sites;

* p<0.05,

** p<0.01,

*** p<0.001

[2] p-values and odds ratios (OR) obtained using logistic regression and GEE to account for clustering of patients within clinicians, adjusting for site. Higher values (greater than 1) indicate a greater likelihood of having the outcome (i.e. reporting the highest level of medication self-efficacy versus less-than-highest levels) with an increase in clinician empathy score.

[3] Low is reference category