Clinician Stress and Patient–Clinician Communication in HIV Care

Neda Ratanawongsa, MD, MPH¹, P. Todd Korthuis, MD², Somnath Saha, MD, MPH^{2,3},
Debra Roter, DrPH⁴, Richard D. Moore, MD, MHS⁴, Victoria L. Sharp, MD⁵, and
Mary Catherine Beach, MD, MPH⁴

¹UCSF Center for Vulnerable Populations at San Francisco General Hospital and Trauma Center, University of California, San Francisco, CA, USA; ²Oregon Health and Science University, Portland, OR, USA; ³Portland VA Medical Center, Portland, OR, USA; ⁴Johns Hopkins University, Baltimore, MD, USA; ⁵St. Luke's-Roosevelt Hospital Center, New York, NY, USA.

BACKGROUND: Clinician stress is common, but few studies have examined its relationship with communication behaviors.

OBJECTIVE: To investigate associations between clinician stress and patient–clinician communication in primary HIV care.

DESIGN: Observational study.

PARTICIPANTS: Thirty-three primary HIV clinicians and 350 HIV-infected adult, English-speaking patients at three U.S. HIV specialty clinic sites.

MAIN MEASURES: Clinicians completed the Perceived Stress Scale, and we categorized scores in tertiles. Audio-recordings of patient–clinician encounters were coded using the Roter Interaction Analysis System. Patients rated the quality of their clinician's communication and overall quality of medical care. We used regression with generalized estimating equations to examine associations between clinician stress and communication outcomes, controlling for clinician gender, clinic site, and visit length.

KEY RESULTS: Among the 33 clinicians, 70 % were physicians, 64 % were women, 67 % were non-Hispanic white, and the mean stress score was 3.9 (SD 2.4, range 0–8). Among the 350 patients, 34 % were women, 55 % were African American, 23 % were non-Hispanic white, 16 % were Hispanic, and 30 % had been with their clinicians >5 years. Verbal dominance was higher for moderate-stress clinicians (ratio=1.93, $p<0.01$) and high-stress clinicians (ratio=1.76, $p=0.01$), compared with low-stress clinicians (ratio 1.45). More medical information was offered by moderate-stress clinicians (145.5 statements, $p<0.01$) and high-stress clinicians (125.9 statements, $p=0.02$), compared with low-stress clinicians (97.8 statements). High-stress clinicians offered less psychosocial information (17.1 vs. 19.3, $p=0.02$), and patients of high-stress clinicians rated their quality of care as excellent less frequently than patients of low-stress clinicians (49.5 % vs. 66.9 %, $p<0.01$). However, moderate-stress clinicians offered more partnering statements (27.7 vs. 18.2, $p=0.04$) and positive affect (3.88 vs. 3.78 score, $p=0.02$) than low-stress clinicians, and their patients' ratings did not differ.

CONCLUSIONS: Although higher stress was associated with verbal dominance and lower patient ratings, moderate stress was associated with some positive communication behaviors. Prospective mixed methods studies should examine the complex relationships across the continuum of clinician well-being and health communication.

KEY WORDS: patient; clinician; stress; communication; HIV.

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INTRODUCTION

Clinicians commonly experience personal or professional stress, a negative emotional reaction caused by imbalance between their environments' demands and their resources to meet these demands.¹ While stress is less enduring than clinician burnout—a syndrome of depersonalization, emotional exhaustion, and reduced sense of accomplishment^{2,3}—stress is more common, particularly in clinics serving patients with complex medical and psychosocial needs.⁴ In a multisite study, one quarter of primary care physicians reported burnout, while a majority acknowledged stressful working conditions, with half reporting time pressure or chaotic work pace and three-quarters reporting low control over their work.⁴ Clinicians serving greater proportions of minority patients have higher odds of reporting stressful work conditions.^{4,5}

High quality patient–clinician communication is important in chronic disease care, influencing patient satisfaction, adherence to medications and self-management, and physical and emotional health and functioning.^{6–11} Provider well-being may be one modifiable factor affecting patient–clinician communication.^{12–20} It is important to understand the relationship between stress and the quality of patient–clinician communication in chronic disease care, including HIV care. Early literature describing HIV clinician well-being focused on acute care clinicians caring for critically or terminally ill patients, with limited data about clinician well-being in long-term outpatient HIV care.^{21–25}

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We investigated the relationship between clinician stress and patient–clinician communication in primary HIV care. We hypothesized that higher stress clinicians, compared with lower stress clinicians, would have lower quality communication characterized by less provision of psychosocial information, less rapport-building, less partnering, less patient-centeredness, and less positive emotional tone. We also hypothesized that patients would be less satisfied with the quality of communication and care provided by higher stress clinicians.

METHODS

Study Design and Sample Population

We conducted a cross-sectional analysis of data from the Enhancing Communication and HIV Outcomes (ECHO) Study. Study subjects were HIV clinicians and patients at three HIV care sites in Baltimore, New York, and Portland. These academically affiliated clinics offer primary HIV care, including: antiretroviral treatment, prevention and treatment of opportunistic infections, and general adult preventive, chronic, and acute medical care. Eligible clinicians were physicians (general internists, infectious disease specialists, and fellows), nurse practitioners, or physician assistants, who provided primary care to HIV-infected patients. Residents and students were excluded. Eligible patients were HIV-infected, over 18 years of age, English speaking, and had at least one prior visit with their clinician. The study received institutional review board (IRB) approval from each site. Because audiotapes from a fourth study site included patient interactions with more than one clinician (a nurse or nurse practitioner, followed by the primary HIV clinician), we excluded data from this site.

Data Collection

All clinicians and patients gave written informed consent. Clinician participants completed a baseline written questionnaire. Subsequently, research assistants enrolled patients of participating clinicians and audio recorded patient–clinician encounters. Patient participants completed a one-hour structured interview about demographic, social, and behavioral characteristics, and ratings of care.

Clinician Stress. Our independent variable was clinician stress, as measured on the baseline questionnaire using the four-item version of the Cohen Perceived Stress Scale (PSS), a previously validated scale with good predictive validity (for longer standardized psychological and physical symptomatology scales) for 4–12 weeks.² Since the four-item version has shown adequate predictive validity and

reliability, we chose the shorter version over the original 14-item scale to minimize respondent burden.^{2,26,27} Items ask how often over the last month respondents felt “difficulties were piling up so high that you could not overcome them,” “that things were going your way,” “confident about your ability to handle your personal problems,” and “that you were unable to control the important things in your life.” The scale does not specifically ask about work or professional settings and is oriented towards personal life stress. Response options range from never (0) to very often,⁴ for a possible total score of 0 to 16 after reverse-scoring the second and third items. Higher scores indicate more stress. In our sample, the PSS had Cronbach’s α of 0.640.

Audio Recorded Measures of Patient and Clinician Communication. Audiotapes were analyzed using the Roter Interaction Analysis System (RIAS), a coding system with well-documented reliability and predictive validity for assessing patient–clinician communication behaviors.^{6,7,28,29} Analysts assign one of 37 mutually exclusive and exhaustive categories to each complete thought expressed by either the patient or clinician. These categories can be combined to reflect broad types of exchange, including rapport-building communication, biomedical talk (oriented towards patient illness and therapy), or psychosocial/lifestyle talk (oriented towards patient experience and life situation). For this study, we focused on the following clinician communication categories:⁷

- Patient-centeredness: summation of codes promoting the socioemotional, psychosocial, and biomedical agenda of the patient, divided by the sum of codes related to the biomedical agenda of the physician. A value greater than 1 denotes a more patient-centered encounter and a value less than 1 denotes a more physician-centered, biomedically oriented encounter.^{20,30–33}
- A verbal dominance ratio: dividing the total amount of physician statements by the total amount of patient statements. Scores greater than 1 indicate more physician statements and scores less than 1 indicate more patient statements.³⁴
- Affect or emotional tone of clinicians: summation of coders’ ratings for their interest/attentiveness, friendliness/warmth, responsiveness/engagement, and sympathy/empathy, and subtracting the degree to which the clinician was hurried/rushed.^{29,34,35}
- Total visit length: minutes of interaction on audio recordings. Although clinicians and patients could opt to stop recordings during visits, this occurred in <0.2 % of study visits.
- Provision of medical information: summation of statements in which clinicians offered medical, therapeutic, or other information or medical / therapeutic counseling.

- Provision of psychosocial information: summation of statements in which clinicians offered lifestyle or psychosocial information or counseling.
- Total rapport-building: summation of statements in which clinician statements reflect:
 - Positive rapport-building (laughter/joking, direct approval, general compliment, or agreement/understanding)
 - Negative rapport-building (direct criticism towards or disagreement with the patient or general criticism about other people)
 - Emotional rapport-building (empathy, legitimation, concern/worry, reassurance/optimism, partnership, or self-disclosure)
- Partnership building: summation of statements in which clinicians ask for patient opinion, ask for reassurance (to proceed), ask if patient understands; paraphrase/interpret what patients say; or offer cues of interest.

Patient Evaluations of Care. Patients rated clinician communication behaviors using a 5-item instrument previously validated for use in HIV care, which asks patients to rate on a 5-point scale (excellent to poor) over the last 12 months how the clinician was in: explaining the results of tests in a way that you understand; giving you facts about the benefits and risks of treatment; telling you what to do if certain problems or symptoms occur; demonstrating caring, compassion, and understanding; and understanding your health worries and concerns.^{36,37} The summary scale score is calculated by averaging responses across the 5 items (Cronbach's α of 0.91 in our sample). Overall satisfaction was rated on a 5-point scale based on responses (poor to excellent) to the question "Overall, how would you rate the quality of medical care you have received in the past 6 months?"

Clinician questionnaires and patient interviews also collected socio-demographic information and overall quality of life in the last week on a visual analog scale. Medical record abstraction provided baseline HIV-related clinical data.

Data Analysis

We used descriptive statistics to explore and describe participant characteristics. After examining the distribution, means, and internal consistency of the PSS, we categorized the stress variable into low, moderate, and high tertiles, to allow examination of graded associations, as has been done with other studies investigating provider well-being and communication.^{20,38}

To investigate relationships between clinician stress and communication, we performed all regression analyses adjusting by clinic site, and used generalized estimating equations (GEE) with an exchangeable correlation structure

to account for within-clinician correlations.³⁹ We used regression with a Gaussian distribution for the outcomes of patient-centeredness, positive clinician affect, verbal dominance, and visit length. For outcomes with positively-skewed counts (provision of biomedical and psychosocial information, rapport-building, and partnering), we used linear regression with negative binomial distributions.⁴⁰ Bivariate analyses showed no association between clinician stress and clinician (age, gender, or race/ethnicity), patient (age, gender, race/ethnicity, educational level, income, CD4 count, or viral load), or relationship variables (gender or race/ethnicity concordance or duration of relationship). However, because literature suggests that clinician gender is associated with clinician well-being and communication, we controlled for this variable in multivariate regressions.^{7,41–44} In a second step, we controlled for visit length for outcomes involving counts of communication behaviors, since longer visits afford the opportunity for more talk by both patients and clinicians.

We used logistic regression for patient ratings (communication quality dichotomized at the highest score vs. other, and overall satisfaction categorized as excellent vs. all other responses), controlling for patient age, race/ethnicity, and quality of life and clinician gender and clinic site.^{45–48}

All analyses were conducted using Stata/SE Version 11.0 (College Station, TX).

RESULTS

Among 55 clinicians eligible for the study, 45 (82 %) participated (two declined, and eight were not enrolled after reaching the enrollment target). Among 617 eligible patients, clinicians declined recruitment for 18 patients; of the remaining 599 patients, 435 (73 %) agreed to participate and completed all study procedures. The most common reasons for declining were: lack of time for the interview ($n=106$), not feeling well ($n=22$), or not interested in studies ($n=13$). For this analysis, 33 clinicians and 350 patients at three sites were included.

Among the 33 clinicians (Table 1), 70 % were physicians, 64 % were women; 67 % were non-Hispanic white; and the mean stress score was 3.9 (SD 2.4). Among the 350 patients (Table 2), 34 % were women; 55 % were African-American, 23 % were non-Hispanic white, 16 % were Hispanic, 30 % had below high school level literacy, and 30 % had been with their clinicians more than 5 years.

Table 3 presents communication behaviors categorized by clinician stress. Verbal dominance was higher for both moderate-stress clinicians (ratio=1.93, $p<0.01$) and high-stress clinicians (ratio=1.76, $p=0.01$), compared with low-stress clinicians (ratio 1.45). Clinician positive affect was higher for moderate-stress clinicians compared with low-stress clinicians (3.88 vs. 3.78, adjusted difference 0.01, 95 % CI

Table 1. Characteristics of 33 Clinicians in the Enhancing Communication and HIV Outcomes (ECHO) Study

Characteristic	
Site, n (%)	
1	14 (42.4)
2	11 (33.3)
3	8 (24.2)
Mean age, years (SD)	42.8 (7.6)
Women, n (%)	21 (63.6)
Discipline, n (%)	
Physician	23 (69.7)
Nurse practitioner	
Physician assistant	3 (9.1)
Race/Ethnicity, n (%)	
White	22 (66.7)
Asian	3 (9.1)
African-American	6 (18.2)
Hispanic or Latino	2 (6.1)
Prior communication training	24 (72.7)
Stress, Mean score (SD)*	3.9 (2.4)
Stress categories, n (%)*	
High: total score 6 – 8	10 (30.3)
Moderate: 3 – 5	11 (33.3)
Low: total score 0 – 2	12 (36.4)

* Cohen Perceived Stress 4-item scale score can range from 0 to 16, with higher scores indicating greater life stress²

0.00–0.01, $p=0.02$), but not different for high-stress clinicians. Patient-centeredness scores did not differ by clinician stress (0.92 for low-stress, 1.11 for moderate-stress, and 0.71 for high-stress clinicians). Visit length was longer for moderate stress clinicians than for low stress clinicians (25.9 vs. 21.9, $p=0.07$), but not statistically significant.

More medical information was offered by moderate-stress clinicians (145.5 statements, adjusted IRR 1.29, 95 % CI 1.10–1.51, $p<0.01$) and high-stress clinicians (125.9 statements, adjusted IRR 1.23, 95 % CI 1.04–1.45, $p=0.02$),

Table 2. Characteristics of 350 Patients with Baseline Audiotaped Patient–Clinician Encounters in the Enhancing Communication and HIV Outcomes (ECHO) Study

Characteristic	
Site, n (%)	
1	128 (36.6)
2	131 (37.4)
3	91 (26.0)
Mean age, years (SD)	45.5 (9.5)
Women, n (%)	120 (34.4)
Race/Ethnicity, n (%)	
White / Caucasian	81 (23.1)
Black / African-American	191 (54.6)
Hispanic / Latino	56 (16.0)
Asian	22 (6.3)
High school degree, n (%)	250 (71.4)
REALM at or above high school	252 (69.4)
Employed	86 (24.6)
Married	46 (12.7)
Current illicit drug use	112 (30.9)
Currently on antiretroviral therapy	269 (78.2)
Viral load	112 (41.8)
CD4	
>400	178 (52.4)
200–399	94 (27.7)
50–199	52 (15.3)
<50	16 (4.7)
Viral load <75	162 (47.9)
Relationship with clinician >5 years	105 (30.2)

compared with low-stress clinicians (97.8 statements). High-stress clinicians offered less psychosocial information than low-stress clinicians (17.1 vs. 19.3, adjusted IRR 0.75, 95 % CI 0.59 – 0.95, $p=0.02$). However, compared with low-stress clinicians, moderate-stress clinicians offered more psychosocial information (32.0 vs. 19.0 statements) and more rapport-building statements (77.2 vs. 100.3), but this difference was not significant after adjusting for the visit length. Moderate-stress clinicians also offered more partnering statements than low-stress clinicians (27.7 vs. 18.2, adjusted IRR 1.45, 95 % CI 1.03–2.06, $p=0.04$).

Compared with patients of low-stress clinicians, patients of moderate and high-stress clinicians did not rate overall communication differently, and patients of moderate-stress clinicians did not rate their overall care quality differently (Table 4). However, patients of high-stress clinicians were less likely to rate their overall quality of care as excellent compared with patients of low-stress clinicians (49.5 % vs. 66.9 %, $p<0.01$).

DISCUSSION

As we hypothesized, higher stress clinicians were more verbally dominant, offered less psychosocial information, and received lower ratings for overall quality of care from their patients compared with low-stress clinicians. However, clinicians in the moderate-stress group—while still more verbally dominant—offered more partnering statements and demonstrated more positive affect compared with lower stress clinicians. Therefore, although our findings support the hypothesis that clinician stress is associated with communication behaviors, they also raise interesting hypotheses regarding how this occurs across the continuum of stress.

Few studies have examined potential associations between clinician well-being and observable communication behaviors or patient satisfaction,^{20,38,49} and none have examined these relationships in chronic HIV care, despite concerns for the well-being of these clinicians.^{21–25} Our study focused on the personal stress experienced by healthcare clinicians, rather than work-related stress or burnout. While capturing the emotional response resulting from environmental demands outweighing resources,¹ the PSS asks clinicians about their problems and control in their overall life, which could include professional life.² In other provider well-being studies, the PSS correlated with work factors and risk of burnout.^{50–52} Nursing home staff PSS scores were correlated with control of work, mastery of work, and workplace social interactions, leadership, organizational culture, and commitment to organization.⁵⁰ Medical students with higher PSS scores had increased odds of developing burnout and decreased odds of recovering from burnout in a longitudinal study.⁵¹ Finally, a workplace mindfulness-based stress reduction program for

Table 3. Communication Outcomes in Encounters with Moderate-Stress and High-Stress Clinicians, Compared with Low-Stress Physicians, in the Enhancing Communication and HIV Outcomes (ECHO) Study (n=33 Clinicians and 350 Patients)

Summary Communication Measures	Stress Tertile	Mean (SD)	Difference in Outcome (95 % CI)*	p-value*		
Verbal dominance	Low	1.45 (0.61)	–			
	Moderate	1.93 (0.88)	0.10 (0.04 – 0.17)	<0.01		
	High	1.76 (0.85)	0.09 (0.01 – 0.16)	0.01		
Clinician positive affect	Low	3.78 (0.33)	–			
	Moderate	3.88 (0.33)	0.01 (0.00 – 0.01)	0.02		
	High	3.75 (0.36)	–0.00 (–0.01 – 0.00)	0.73		
Patient centeredness	Low	0.92 (0.67)	–			
	Moderate	1.11 (2.49)	0.11 (–0.13 – 0.35)	0.36		
	High	0.71 (0.52)	–0.13 (–0.32 – 0.06)	0.18		
Visit length, minutes	Low	21.9 (9.7)	–			
	Moderate	25.9 (10.6)	0.01 (–0.00 – 0.01)	0.07		
	High	23.5 (10.6)	0.00 (–0.00 – 0.01)	0.39		
Clinician Communication Behaviors	Stress Tertile	Statements Mean (SD)	IRR (95 % CI)*	p-value*	IRR (95 % CI)†	p-value†
Provides medical information	Low	97.8 (52.6)	–		–	
	Moderate	145.5 (73.9)	1.47 (1.22 – 1.77)	<0.01	1.29 (1.10 – 1.51)	<0.01
	High	125.9 (66.0)	1.31 (1.06 – 1.59)	0.01	1.23 (1.04 – 1.45)	0.02
Provides psychosocial information	Low	19.3 (22.7)	–		–	
	Moderate	32.0 (31.6)	1.53 (1.14 – 2.07)	<0.01	1.24 (0.95 – 1.63)	0.12
	High	17.1 (17.3)	0.81 (0.59 – 1.10)	0.17	0.75 (0.59 – 0.95)	0.02
Total rapport-building	Low	77.2 (33.7)	–		–	
	Moderate	100.3 (42.9)	1.26 (1.01 – 1.58)	0.04	1.15 (0.98 – 1.35)	0.09
	High	80.1 (37.7)	1.00 (0.81 – 1.24)	0.99	0.97 (0.81 – 1.16)	0.73
Partnering	Low	18.2 (11.5)	–		–	
	Moderate	27.7 (20.6)	1.61 (1.11 – 2.34)	0.01	1.45 (1.03 – 2.06)	0.04
	High	23.3 (15.2)	1.26 (0.94 – 1.69)	0.12	1.20 (0.93 – 1.55)	0.16

* Analysis compared moderate-stress and high-stress groups with low-stress group using generalized estimating equations, adjusted for clinician gender and site

† Analysis compared moderate-stress and high-stress groups with low-stress group using generalized estimating equations, adjusted for clinician gender, site, and visit length

neonatal intensive care staff led to reductions in PSS and increases in SF-36 Mental Component Scores.⁵² These studies suggest that the healthcare work environment can contribute to overall personal stress, which could then increase or decrease risk of burnout at work. So, although the PSS does not specifically focus on stress limited to workplace stressors, it offers a useful metric for clinician well-being.

Stress may be more modifiable than clinician burnout, an enduring negative emotional state.^{3,53} However, stress and burnout may be linked in a causal cycle, as in a longitudinal

study which found that stress makes clinicians more emotionally exhausted and that emotional exhaustion makes clinicians feel more stressed.⁵³ If a clinician stress could be alleviated by reducing demands or increasing coping resources, the cycle leading to burnout could be mitigated, which could enhance workforce retention in settings serving patients with complex needs.^{1,2,4,5,53}

Our findings raise questions about how stress may affect and be affected by communication, and how these associations may differ for burnout. We hypothesized that higher clinician stress would be associated with poorer communication behaviors and patient ratings because reduced well-being may make clinicians less empathic or reduce their capacity to be mindful in their communication.^{54–58} However, this may be more applicable to only higher levels of stress or the resulting emotional exhaustion accompanying burnout, which was not measured in our study. Our findings that patients of high-stress clinicians were less likely to rate their care as excellent are congruent with outpatient studies that found that components of burnout—depersonalization and exhaustion—were associated with lower patient satisfaction.^{38,49} In our study, there is no clear difference in communication behavior to explain why patients of high-stress clinicians had lower patient satisfaction with care, particularly since patients' overall ratings of provider communication did not differ for this group. The only communication behavior associated with high clinician stress was verbal dominance, but this was true for moderate-stress

Table 4. Patient Ratings of Moderate-Stress and High-Stress Clinicians, Compared with Low-Stress Clinicians, in the Enhancing Communication and HIV Outcomes (ECHO) Study (n=33 Clinicians and 350 Patients)

Patient Ratings	Stress Tertile	Proportion	Adjusted Odds Ratio (95 % CI)*	p-value*
Overall communication score at highest rating	Low	37.9 %	–	
	Moderate	45.2 %	1.36 (0.72 – 2.58)	0.25
	High	34.2 %	0.86 (0.45 – 1.66)	0.66
Overall quality of care rated as excellent	Low	66.9 %	–	
	Moderate	60.9 %	0.66 (0.35 – 1.26)	0.21
	High	49.5 %	0.40 (0.21 – 0.76)	<0.01

* Analysis compared moderate and high-stress groups with low-stress group using generalized estimating equations, adjusted for patient age, race/ethnicity, and health status and clinician gender and site

clinicians without any difference in provider ratings. It is possible that some unmeasured common factors heightened both clinician stress and the patients' experiences of their care (such as larger patient panel sizes or shorter patient visits), and that these factors—rather than provider communication—are what affect patient satisfaction.^{4,5} However, it is important to note that this analysis did not examine objective measures of quality of care, but rather patients' experiences of that care.

Meanwhile, the findings may suggest that moderate-stress clinicians are working harder to communicate with their patients than those with higher or lower stress. A moderate level of stress may be a marker of highly conscientious clinicians responding to the perceived needs of their patients, thus explaining its association in our study with greater provision of both medical and psychosocial information, rapport-building, partnering, and positive affect. Although some of these associations became statistically insignificant when controlling for visit length, this may belie a tendency for moderate-stress clinicians to have longer encounters with their patients, enabling these communication behaviors. Another explanation is that these clinicians may work harder to engage in their relationships with patients because they work in more stressful environments that lack of resources outside of the encounter to enhance chronic disease outcomes.^{4,5} Alternatively, the process of working harder to communicate and engage with patients may actually lead to moderate levels of stress. A previous study found that primary care patients engaged in more rapport-building with physicians with lower well-being, theorizing that these clinicians may experience patient engagement as increased demands and develop compassion fatigue.²⁰

Thus, at moderate stress, clinicians may communicate more effectively than their colleagues, but at the highest levels of stress, clinicians may exceed their capacity to exert this additional effort. This supports the concept of an “inverse U” relationship between stress and job performance, as found in a study of nurses' self-reported stress and job performance.^{59,60} Cohen theorized that individuals exposed to uncontrollable and unpredictable stressors show greater arousal, which leads to improved performance. However, when stress becomes too great, performance diminishes, in part due to a narrowing of attention during arousal that can lead to “insensitivity to social cues.”⁵⁹

Our study had several limitations. First, clinician stress may have changed from the date of the questionnaire to the dates of patient visits; however, the PSS has been found to have validity for up to 12 weeks after administration, and our encounters were conducted 1 to 16 weeks after PSS administration.^{2,3} Second, we specifically measured personal stress, and future studies may wish to examine both personal and professional stress, and coping strategies or resiliency. Third, the process of audiotaping may have

changed patients' or clinicians' communication behaviors, but previous studies have revealed this observational methodology provides valid data about encounter behaviors,⁶¹ and we have no reason to believe that the “Hawthorne effect” would have differential effects by clinician stress. Fourth, this study aimed to examine outcomes related to communication and patients' experiences of care, and we did not analyze process or clinical outcomes representing the quality of care delivered. Fifth, although this was a multisite study with a diverse patient and clinician population, our findings may not be generalizable to other clinical settings serving different populations, or to those with different chronic medical conditions. Sixth, we may have been underpowered to detect differences in communication behaviors or missed non-verbal communication behaviors, such as visual cues. Finally, these cross-sectional findings cannot offer conclusions regarding causality.

In summary, although higher stress was associated with verbal dominance and lower patient ratings, moderate stress was associated with some positive communication behaviors. Prospective mixed methods studies should investigate associations among clinician well-being, patient–clinician communication, and quality of care. Given recent evidence of the effectiveness of mindfulness interventions in improving clinician empathy and well-being, systems-based interventions to improve the experience of care for HIV-infected patients should consider targeting clinician stress as a potentially modifiable factor in patient-reported experiences of care.⁵⁸

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Corresponding Author: Neda Ratanawongsa, MD, MPH; UCSF Center for Vulnerable Populations at San Francisco General Hospital and Trauma Center, University of California, 1001 Potrero Avenue, Box 1364, San Francisco, CA 94110, USA (e-mail: ratanawongsan@medsfgh.ucsf.edu).

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