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Improved Health Outcomes in Integrative Medicine Visits May Reflect Differences in Physician and Patient Behaviors Compared to Standard Medical Visits

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Abstract

Objective: To identify differences in patient-physician interactions associated with improvements in GERD symptoms in a randomized controlled trial comparing integrative medicine and primary care/standard visits.

Methods: We analyzed video recordings of 2-minute excerpts (thin slices) from the beginning, middle, and end of 21 study visits (11 standard, 10 integrative medicine).

Results: According to blind coders' analysis of the excerpts, prospective improvement in GERD symptoms was most highly correlated with patients appearing pleased (r=0.71, p<0.01) and friendly (r=0.67, p<0.01) at the end of the visit, controlling for visit type. The combination of patient and physician smiling at the end of the visit was associated with improvement in GERD symptoms (r^2=0.45, p=0.004). The physician in the integrative visits was more engaged (p=0.009), friendly (p=0.005), relaxed (p=0.002), smiled longer (p=0.006), gazed longer (p=0.02), and gestured more (p=0.007), compared to standard visits. Patients in integrative visits also smiled longer (p=0.004).

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Conclusion: The expanded history-taking questions asked by integrative clinicians may enhance relationship building, modifying patients' responses and improving patient-centered behaviors from clinicians,-ultimately facilitating symptom improvement.

Practice Implications: Analysis of nonverbal behaviors may facilitate a better understanding of patient-clinician interactions in integrative medicine visits and yield insights to improve clinical interactions in conventional medicine.

Keywords

Physician-patient relations; gastroesophageal reflux; integrative medicine; patient-centered care; nonverbal communication; video recording

1. Introduction

The quality of the interaction between a patient and healthcare professional affects patient satisfaction, adherence, information recall, and understanding [1-3]. A growing body of literature suggests that the quality of this interaction can also powerfully affect health outcomes via mechanisms that are poorly understood, but are different from adherence [4-7]. However, most of these studies have used low patient-centered control groups to demonstrate benefits on health outcomes. While informative, such controls model what one hopes is not happening in routine medical care (i.e., a potential negative effect control). Whether the patient-clinician relationship can be further augmented beyond what is generally considered a high-quality interaction and yield additional improvement in health outcomes is an open question.

Qualitative studies of patients who have incorporated complementary and integrative health modalities into their care suggest that these practitioners enable interactions that are qualitatively different from the interactions patients have had with their conventional medical providers [8-10]. For example, patients may have more time with these clinicians, more opportunity to share their illness narrative, feel more empowered, less "stuck", and appreciate the value of the healing relationships that are formed.

Integrative clinicians often ask questions, as part of their history taking process, that may seem unusual or unrelated from a conventional medicine standpoint. These questions, typically not asked in a conventional medicine visit, are intended to help the integrative clinician better understand a patient's constitutional type or their personality to guide treatment. While considered irrelevant from a conventional medicine perspective, such information is critically important in optimally tailoring a treatment to the patient within the context of many integrative, whole-person, systems of care (e.g., homeopathy, traditional Chinese medicine, Ayurveda, naturopathy). In addition to extending the time spent with the clinician, these questions may contribute to patient perceptions of physicians seeking a deeper understanding of their lives and being cared for in a way that is different from their experience in many conventional medical visits.

One way of studying the interactions between patients and healthcare professionals is to analyze audio or video recordings of their interactions. While a variety of linguistically-

based coding systems have been described [11-13], a wealth of data links nonverbal communication with outcomes of clinical interactions, as documented in reviews of the literature [2,14-17]. Patient satisfaction has been predicted by health care providers' nods, gestures, gaze, back-channel responses (e.g., mmm-hmmm), and smiling [18-21]. Poor eye contact and lack of smiling had negative prospective health effects on elderly inpatients [22]; dominant voice in physicians predicted more malpractice suits [23]. Global impression ratings have shown many correlates in terms of quality of care, satisfaction, and quality of relationship [21,24,25]. Moreover, as coding entire interactions can be laborious, studies have demonstrated that analysis of short segments of the encounter, one to two minutes in length (also known as "thin slices") is highly predictive of behavior in the clinical encounter overall [26,27] as well as of patient outcomes [17,21,28]. Despite these advances and the extensive literature using these techniques to analyze patient-physician interactions, these methods have not been applied to understanding patient interactions with integrative health practitioners.

In a recent randomized controlled trial of patients with gastroesophageal reflux disease (GERD) who were randomized to receive a high patient-centered primary care visit (standard) vs. an integrative medicine consultation (expanded), individuals who received the expanded visit were more likely to have improvement in their GERD symptoms compared to those who received the standard visit (p = 0.01) regardless of the treatment received [6]. There were no differences in patients' ratings of the physician on the Consultation and Relational Empathy (CARE) measure [29] between the two groups, and the CARE score was not associated with symptom improvement. To better understand how the expanded visit may lead to improved health outcomes, we analyzed thin slices from video recordings from this trial.

2. Methods

1.1 Parent study

We analyzed videos from a randomized controlled trial examining the effect of the patient-doctor interaction on GERD symptom severity. Detailed methods are described elsewhere [6]. In brief, 24 patients with GERD symptoms 3 or more days per week received a single intake visit with a physician. Severity of GERD symptoms were assessed by self-report on a 7-day symptom diary for one week immediately prior to enrolling in the study (baseline measure) and one week prior to a two-week follow-up visit (follow-up or post GERD severity). Possible scores ranged from 0-12 with higher scores indicating more severe symptoms (sum of daytime heartburn, nighttime heartburn, and acid regurgitation symptoms each rated 0-4 in severity [none, mild, moderate, severe, very severe]).

Patients were randomized 1:1 to either a "standard intake visit" modeled after a-high patient-centered primary care visit or an "expanded intake visit" modeled after an integrative medicine consultation. A single physician (MLD) conducted all of the study intake visits and followed one of two standardized visit templates (Appendix A, [6]) to maintain consistency across intake visits. The physician was a conventionally trained general internist with additional fellowship training in integrative medicine. She was instructed to behave similarly in both visit types (e.g., warm and friendly disposition, maintain eye contact, active

listening and repeating back the patient's words, expressions of empathy, and confidence that the study treatment would be effective [5]) such that the only intentional difference between visit types were the questions she asked from the template. A fidelity check of a random sample of 25% of the videos (3 standard and 3 expanded) confirmed that the study physician adhered to the protocol and followed the visit templates. The integrative visit included all standard visit questions plus additional questions about the nature of the GI symptoms (e.g., taste of reflux, food cravings and aversions), other health issues, and the patient's temperament (e.g., shy, anxious, caring). Some of these questions addressed the patient's "constitutional type" as might be assessed by some integrative practitioners (e.g., tell me about your sleep; do you tend to be hot or cold?). To reduce the potential for introducing bias, visit randomization occurred immediately prior to the study physician entering the room to conduct the study visit, after all baseline data had been collected.

Patients were told they would be randomized 1:1 to receive either a placebo or "natural supplement" to test whether the supplement improved GERD symptom severity. In actuality, patients were randomized in a 2x2 factorial design (supplement vs. placebo and standard vs. expanded visit, n=6 in each of 4 groups). There was no effect of the supplement in the parent study. Patients were not aware that we were studying their intake visit interaction with the physician. Study intake visits were video recorded from the start of the visit up to but not including the physical exam, which occurred at the very end of the visit. A single video camera was used, was in plain sight, and patients were told that we would use the footage to analyze what the study physician did. After the first 1-2 minutes, patients largely ignored the video camera. All patients provided written informed consent and were debriefed at the end of the study that we were also studying the patient-doctor interaction. The study was approved by the human subjects review board at Beth Israel Deaconess Medical Center.

2.1 Video ratings

Twenty-one patients in the parent study consented to video recording. For the present study, two-minute excerpts from the very beginning (first two minutes), exact middle, and very end (last two minutes prior to the physical exam which was off screen, identical for both visit types, and ended the visits) of each study visit video were assessed by trained and blinded coders who rated the video excerpts for global impressions (1-9 scale) and nonverbal behaviors. Thin slices for rating were edited out of the full-length video recordings and put into designated folders for coders to view. Coders were unaware that there were two visit types and were asked to simply analyze what they observed across a variety of different two-minute long patient-doctor interactions. Global impressions were: engagement (physician and patient), friendliness (physician and patient), relaxed (physician and patient), empathic (physician), reciprocity (dyad), business-like (physician), dominant (physician), confident (patient), and pleased (patient). Nonverbal behaviors that were counted or timed for both parties were: gaze duration and number, smile duration and number, number of nods, self-touch (hands to face, hair, or hands), and gestures. We also assessed the number of physician backchannel responses while patients spoke (e.g., "uh huh,"), the number of instances of shared laughter between the dyads, and the length of time that both the patient and physician spoke. The nonverbal behaviors and global impressions that were measured in the present study were based on the reviewed literature as well as our desire to capture the spectrum of

nonverbal behaviors that are routinely measured in the nonverbal communication literature [15,26,30]. Although the visits differed in their overall length, we analyzed thin slices of the same duration from each visit.

2.3 Statistical analyses

Reliabilities between coders (Cronbach's alpha) were 0.7 or greater for all nonverbal behaviors and for the majority of global impressions (Appendix B). For each construct, ratings from two coders were averaged for subsequent analyses (although different coders rated different constructs, within a given construct and time point, the same two coders were used for all slices). As principal components analyses failed to find a stable set of components across time conditions, each impression and behavior was analyzed separately. We assessed the correlation between each global impression or nonverbal behavior and GERD symptom response to treatment (an *a priori* defined dichotomous variable defined as a 50% or greater improvement in GERD symptom severity from baseline to follow-up). We used analysis of variance (ANOVA)-modeling to examine the contributions of both physician and patient smiling frequency on GERD symptom response. Next, we created repeated measures ANOVA models including all of the global impressions or nonverbal behaviors as the dependent variables. Models assessed both time (beginning, middle, end; as both a linear and quadratic variable) and visit type (standard or expanded) effects as well as the interaction of the two (time x visit type) as independent variables. For the final regression analyses, we averaged values for each of the global impressions or nonverbal behaviors over the three timepoints and included this value along with visit type as the independent variables and GERD response as the dependent variable.

3 Results

Demographic characteristics of the 21 patients-(11 standard, 10 expanded) with video data are presented in Table 1 and are similar to those of the parent study population. This tended to be an older population (50s-60s), predominantly female and Caucasian, with almost half taking medications for GERD symptoms and still having breakthrough symptoms. Visit length averaged 19 minutes (SD 6) for patients randomized to the standard group and 42 minutes (SD 13) for patients randomized to the expanded group (difference between groups, $p < 0.001$). GERD symptoms for patients in the standard group decreased from an average of 5.0 (SD 2.4) to 3.7 (SD 2.3). GERD symptoms for patients in the expanded group decreased from an average of 3.8 (SD 2.3) to 1.3 (SD 1.3). As observed in the parent study, there were no significant differences in GERD symptoms between groups at baseline ($p = 0.26$). Two weeks following the study visit, patients in the expanded group had a significantly greater improvement in GERD symptom severity compared to patients in the standard group ($p = 0.02$).

To understand the visit characteristics associated with GERD symptom improvement in this population, we analyzed two-minute video excerpts from the beginning, middle, and end of all study visits. The global impressions most highly correlated with response to GERD treatment (in the whole sample) were patient friendliness ($r = 0.669$, $p = 0.001$) and how pleased the patient seemed ($r = 0.709$, $p < 0.001$) at the end of the visit and how relaxed the

physician was (r = 0.655, p = 0.001, beginning of the visit; Table 2). The nonverbal behaviors most highly correlated with response to GERD treatment were physician smiling (0.549 – 0.583, all 3 timepoints, p =< 0.01), and patient smile number and duration (r = 0.556 and 0.549, p = 0.009 and 0.01, respectively) and patient nods (r = 0.635, p = 0.002) at the end of the visit.

The frequency of physician and patient smiling combined were significantly associated with response to GERD treatment at all three timepoints (Table 3). Physician smiling was significantly associated at the middle and end timepoints and patient smiling at the final timepoint only. At the final timepoint, both variables together predicted 45% of the variance in GERD response (model p = 0.004), with similarly sized beta coefficients (0.410 and 0.399, respectively).

Many of the patient-centered global impressions and nonverbal behaviors increased significantly over the course of both visit types (Tables 4 and 5). We found that the study physician was more friendly (p < 0.001), relaxed (p = 0.02), empathic (p < 0.001), and had greater reciprocity with the patient (p = 0.009) as the visits progressed over time. Similarly, the physician gazed more frequently (p < 0.001) and longer (p < 0.001), smiled more frequently (p < 0.001) and longer (p < 0.001), touched themselves more (p < 0.001), gestured more (p < 0.001), offered more backchannel responses (p = 0.04), and laughed more with the patient (p < 0.001) as the visits progressed. In addition, patients were more friendly (p < 0.001), relaxed (p = 0.01), confident (p = 0.03), and pleased (p < 0.001) as well as smiled more frequently (p = 0.003) and longer (p = 0.001) and touched themselves more (p = 0.004) over time from the beginning to the end of the visits.

Nonetheless, in thin slices of the expanded visits, the study physician was rated as significantly more engaged (p = 0.009), friendly (p = 0.005), relaxed (p = 0.002), and less business-like (p = 0.03) than in thin slices from the standard visits. Similarly, the physician in the expanded visits gazed longer at the patient (p = 0.02), smiled more (p = 0.006) and longer (p = 0.006), gestured more (p = 0.007), talked more (p = 0.02), and offered fewer backchannel responses (p = 0.03) than in standard visits. Patients in the expanded visits also smiled more (p = 0.04) and longer (p = 0.004) than patients in the standard visits. Reassuringly, there were no significant differences in any global impressions or nonverbal behaviors between the standard and expanded visit types at the beginning of the study visits as they were designed to begin similarly (data not shown).

There were also significant time by intervention effects for physician and patient friendliness, business-like (physician), dominant (physician), and pleased (patient) (Table 4). Interaction effects for the nonverbal behaviors were seen for physician gaze and smile duration, patient smile number and duration, physician gestures, time physician spent talking, physician backchannel responses and shared laughter between the physician and patient (Table 5).

Despite the observed differences in the levels of global impressions and nonverbal behaviors between visit types, and despite the difference in overall visit length betweenthe two visit types, when we controlled for visit type in regression modeling (combining slices from all

three timepoints to increase measurement reliability), several global impressions and nonverbal behaviors and were significantly associated with subsequent improvement in GERD symptoms. These global impressions were physician and patient friendly, patient engaged, patient relaxed, patient pleased, physician empathic, physician business-like (negative), and physician dominant (negative; data not shown). The nonverbal behaviors that were significantly associated with improvement in GERD symptoms after controlling for visit type were physician smile frequency, patient smile duration, and patient nods (data not shown). As visit type and visit length are highly correlated (r = 0.77), we found similar results when we controlled for visit length instead of visit type (data not shown).

4 Discussion and Conclusion

4.1 Discussion

In this study, we found that several physician (friendly, empathic, not business-like, not dominant, smile frequency) and patient (engaged, friendly, relaxed, pleased, smile duration, nods) global impressions and nonverbal behaviors were associated with subsequent improvement in patients' GERD symptoms, controlling for visit type. Although patient-centered nonverbal behaviors and global impressions of the physician increased over the course of both visit types, some of these increases were significantly more pronounced in the expanded visits compared to the standard visits (e.g., longer gaze, more smiling and gesturing, more engaged, friendly, and relaxed and less business-like). The observed increases in these behaviors were associated with greater improvements in GERD symptom severity in patients who were randomized to receive the expanded visit type.

Detailed video analyses of patient-clinician interactions have not been previously used to examine integrative medicine consultations. Though our results are not surprising given previous qualitative studies of patients who have seen integrative practitioners [8-10], what is notable is that the physician in this study was identical for both visit types and was instructed to behave similarly (equivalent displays of care and concern for the patient) across all visits while following the visit question templates. Our fidelity check confirmed that the physician followed the templates and, in the parent study, there were no significant differences in patients' ratings of the physician as measured by the CARE measure between the two groups. There were, however, ceiling effects in both groups, and CARE score was not associated with symptom improvement [6]. Thus, the differences in the physician's nonverbal behaviors (as scored by the blinded raters) between the two visit types are not intentional behavior changes and were not particularly discernible by patients. We propose that the unique questions in the expanded visit template (or patients' reactions to them) encouraged more patient-centered behaviors from the physician, which in turn yielded favorable emotional responses from the patient.

By the end of the visits, patient smiling and seeming pleased and friendly (regardless of visit type) were highly correlated with subsequent improvements in GERD symptom severity, suggesting that the increased patient-centered behaviors on the part of the physician contributed to this shift in patient demeanor and improvements in GERD symptoms. Indeed, prior work has suggested that patients are highly attuned to physician positive affect [32]. The mechanisms by which increased patient-centered behaviors from physicians and

positive shifts in patient demeanor lead to patient symptom improvement are unknown, though hypotheses have been offered [1]. In this study the supplement provided and differences in adherence to the supplement cannot explain the differences in symptom improvement observed. One possibility is that the expanded visit questions caused patients to behave differently in some way that we did not measure, but that the physician non-consciously perceived and responded to during the interaction. Indeed, patient affect can influence physician behavior [33,34]. The expanded visit questions may have set the stage for a reciprocated positive feedback loop.

Our results suggest that there is significant room to augment patient-centeredness in primary care visits and that some of the questions asked (and patient responses) during integrative medicine consultations may promote increased patient-centered behaviors from physicians and/or positive shifts in patient perceptions of the encounter. Although the standard and expanded visits differed significantly in length, visit length was not associated with improvement in GERD symptom severity ($p = 0.50$) in the parent study (although we may have been underpowered to detect an effect [6]). Nonetheless, visit length and visit type are highly correlated, and thus, visit length may be confounding some of our results. In this study, we cannot entirely separate the effect of spending more time with a patient from the effect of a caring physician asking more in-depth questions. Rather than the absolute amount of time being important, we suggest that it is how that time is spent that brings meaning and engagement to the encounter. The questions unique to the expanded visit format that assess patients' constitutional types and idiosyncratic natures that make patients uniquely who they are may indicate a level of interest or engagement on the part of clinicians that patients interpret and experience, either consciously or even non-consciously, as more patient-centered or somehow representing a greater degree of care for them personally and/or allow patients to feel heard. In addition, such questions may cause patients to reflect on, and make meaning of, their symptoms in different ways, thus shifting patients' relationships with their symptoms and their illness narratives. Future studies should assess these domains to better understand what is occurring.

There are several limitations to our study including the small sample size of subjects and performance of a single physician. Future studies should include larger numbers of subjects and physicians. Although we rigorously tried to reduce bias throughout the data acquisition and analysis phases, the study physician could not be blinded and we cannot exclude the potential for unintended bias contributing to our results. In addition, we cannot entirely separate the effects of visit length from visit content. Future studies should examine the relative contributions of these two components to the dynamics of patient-physician interactions and subsequent health outcomes. Finally, we did not correct our significance tests for multiple comparisons due to the pilot/hypothesis-generating nature of this study. Despite these shortcomings, the significant results from the primary study makes it nonetheless valid to examine these videos for potential associations to generate hypotheses for future studies.

Conclusion

In summary, both physician behavior (friendly, empathy, not business-like, not dominant, smile frequency) and patient behavior (engaged, friendly, relaxed, pleased, smile duration, nods) were associated with subsequent improvement in patients' GERD symptoms, irrespective of visit type. Though most patient-centered behaviors and impression ratings increased over the course of both visit types, in the expanded visits, the physician gazed longer at the patient, smiled more, gestured more, spoke longer, had fewer backchannel responses and was rated as being more engaged, friendly, and relaxed and less business-like compared to standard visits. Moreover, in expanded visits, the patients smiled more and longer. Regardless of visit type, both patient and physician smiling were significantly associated with GERD symptom improvement – physician smiling at the middle and end of the visit and patient smiling at the end of the visit – suggesting that patient smiling may be reciprocating physician smiling. Patients' response to the questions unique to expanded/integrative visits may encourage more patient-centered behaviors from physicians which in turn modifies patient behaviors and affects health outcomes.

Practice Implications

Our results suggest that there may be utility to using thin slice analysis to better understand patients' interactions with integrative health practitioners. Patients' response to questions asked as part of an integrative clinicians' history taking may enhance patient-centered behaviors from clinicians, leading to shifts in patients' demeanor and improvements in health outcomes. Clinician and patient smiling may be a marker for this process.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

References

[1]. Street RL, Makoul G, Arora NK, Epstein RM, How does communication heal? Pathways linking clinician-patient communication to health outcomes, Patient Educ. Couns 74 (2009) 295–301. 10.1016/j.pec.2008.11.015. [PubMed: 19150199]

[2]. Schmid Mast M, On the importance of nonverbal communication in the physician-patient interaction, Patient Educ. Couns 67 (2007) 315–318. 10.1016/j.pec.2007.03.005. [PubMed: 17478072]

[3]. Hall JA, Roter DL, Katz NR, Meta-analysis of correlates of provider behavior in medical encounters, Med. Care 26 (1988) 657–675. [PubMed: 3292851]

[4]. Rakel D, Barrett B, Zhang Z, Hoeft T, Chewning B, Marchand L, Scheder J, Perception of empathy in the therapeutic encounter: effects on the common cold, Patient Educ. Couns 85 (2011) 390–397. 10.1016/j.pec.2011.01.009. [PubMed: 21300514]

[5]. Kaptchuk TJ, Kelley JM, Conboy LA, Davis RB, Kerr CE, Jacobson EE, Kirsch I, Schyner RN, Nam BH, Nguyen LT, Park M, Rivers AL, McManus C, Kokkotou E, Drossman DA, Goldman P, Lembo AJ, Components of placebo effect: randomised controlled trial in patients with irritable bowel syndrome, BMJ. 336 (2008) 999–1003. 10.1136/bmj.39524.439618.25. [PubMed: 18390493]

[6]. Dossett ML, Mu L, Davis RB, Bell IR, Lembo AJ, Kaptchuk TJ, Yeh GY, Patient-Provider Interactions Affect Symptoms in Gastroesophageal Reflux Disease: A Pilot Randomized, Double-Blind, Placebo-Controlled Trial, PloS One. 10 (2015) e0136855 10.1371/journal.pone.0136855. [PubMed: 26422466]

[7]. Fuentes J, Armijo-Olivo S, Funabashi M, Miciak M, Dick B, Warren S, Rashiq S, Magee DJ, Gross DP, Enhanced therapeutic alliance modulates pain intensity and muscle pain sensitivity in patients with chronic low back pain: an experimental controlled study, Phys. Ther 94 (2014) 477–489. 10.2522/ptj.20130118. [PubMed: 24309616]

[8]. Steinsbekk A, Launsø L, Empowering the cancer patient or controlling the tumor? A qualitative study of how cancer patients experience consultations with complementary and alternative medicine practitioners and physicians, respectively, Integr. Cancer Ther 4 (2005) 195–200. 10.1177/1534735405276721. [PubMed: 15911932]

[9]. Mulkins AL, Verhoef MJ, Supporting the transformative process: experiences of cancer patients receiving integrative care, Integr. Cancer Ther 3 (2004) 230–237. 10.1177/1534735404268054. [PubMed: 15312264]

[10]. Koithan M, Embrey M, Bell IR, Qualitative evaluation of successful homeopathic treatment of individuals with chronic diseases: descriptive phenomenology of patients' experiences, J. Med. Pers 13 (2014) 23–35. 10.1007/s12682-014-0185-2.

[11]. Roter D, Larson S, The Roter interaction analysis system (RIAS): utility and flexibility for analysis of medical interactions, Patient Educ. Couns 46 (2002) 243–251. [PubMed: 11932123]

[12]. Bylund CL, Makoul G, Empathic communication and gender in the physician-patient encounter, Patient Educ. Couns 48 (2002) 207–216. 10.1016/s0738-3991(02)00173-8. [PubMed: 12477605]

[13]. Del Piccolo L, de Haes H, Heaven C, Jansen J, Verheul W, Bensing J, Bergvik S, Deveugele M, Eide H, Fletcher I, Goss C, Humphris G, Kim Y-M, Langewitz W, Mazzi MA, Mjaaland T, Moretti F, Nübling M, Rimondini M, Salmon P, Sibbern T, Skre I, van Dulmen S, Wissow L, Young B, Zandbelt L, Zimmermann C, Finset A, Development of the Verona coding definitions of emotional sequences to code health providers' responses (VR-CoDES-P) to patient cues and concerns, Patient Educ. Couns 82 (2011) 149–155. 10.1016/j.pec.2010.02.024. [PubMed: 20346609]

[14]. Beck RS, Daughtridge R, Sloane PD, Physician-patient communication in the primary care office: a systematic review, J. Am. Board Fam. Pract. Am. Board Fam. Pract 15 (2002) 25–38.

[15]. Blanch-Hartigan D, Ruben MA, Hall JA, Schmid Mast M, Measuring nonverbal behavior in clinical interactions: A pragmatic guide, Patient Educ. Couns 101 (2018) 2209–2218. 10.1016/j.pec.2018.08.013. [PubMed: 30146408]

[16]. Roter DL, Frankel RM, Hall JA, Sluyter D, The expression of emotion through nonverbal behavior in medical visits. Mechanisms and outcomes, J. Gen. Intern. Med 21 Suppl 1 (2006) S28–34. 10.1111/j.1525-1497.2006.00306.x.

[17]. Slepian ML, Bogart KR, Ambady N, Thin-slice judgments in the clinical context, Annu. Rev. Clin. Psychol 10 (2014) 131–153. 10.1146/annurev-clinpsy-090413-123522. [PubMed: 24423788]

[18]. Griffith CH, Wilson JF, Langer S, Haist SA, House staff nonverbal communication skills and standardized patient satisfaction, J. Gen. Intern. Med 18 (2003) 170–174. 10.1046/j.1525-1497.2003.10506.x. [PubMed: 12648247]

[19]. Bensing J, Doctor-patient communication and the quality of care, Soc. Sci. Med 1982. 32 (1991) 1301–1310. 10.1016/0277-9536(91)90047-g. [PubMed: 2068614]

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[20]. Larsen KM, Smith CK, Assessment of nonverbal communication in the patient-physician interview, J. Fam. Pract 12 (1981) 481–488. [PubMed: 7462949]

[21]. Hall JA, Irish JT, Roter DL, Ehrlich CM, Miller LH, Satisfaction, gender, and communication in medical visits, Med. Care 32 (1994) 1216–1231. 10.1097/00005650-199412000-00005. [PubMed: 7967860]

[22]. Ambady N, Koo J, Rosenthal R, Winograd CH, Physical therapists' nonverbal communication predicts geriatric patients' health outcomes, Psychol. Aging 17 (2002) 443–452. 10.1037/0882-7974.17.3.443. [PubMed: 12243386]

[23]. Ambady N, Laplante D, Nguyen T, Rosenthal R, Chaumeton N, Levinson W, Surgeons' tone of voice: a clue to malpractice history, Surgery. 132 (2002) 5–9. 10.1067/msy.2002.124733. [PubMed: 12110787]

[24]. Bensing JM, Dronkers J, Instrumental and affective aspects of physician behavior, Med. Care 30 (1992) 283–298. 10.1097/00005650-199204000-00001. [PubMed: 1556878]

[25]. Cox ED, Smith MA, Brown RL, Fitzpatrick MA, Assessment of the physician-caregiver relationship scales (PCRS), Patient Educ. Couns 70 (2008) 69–78. 10.1016/j.pec.2007.08.004. [PubMed: 17988823]

[26]. Murphy NA, Hall JA, Schmid Mast M, Ruben MA, Frauendorfer D, Blanch-Hartigan D, Roter DL, Nguyen L, Reliability and validity of nonverbal thin slices in social interactions, Pers. Soc. Psychol. Bull 41 (2015) 199–213. 10.1177/0146167214559902. [PubMed: 25488925]

[27]. Murphy NA, Hall JA, Ruben MA, Frauendorfer D, Schmid Mast M, Johnson KE, Nguyen L, Predictive Validity of Thin-Slice Nonverbal Behavior from Social Interactions, Pers. Soc. Psychol. Bull 45 (2019) 983–993. 10.1177/0146167218802834. [PubMed: 30400748]

[28]. Hall JA, Roter DL, Blanch DC, Frankel RM, Observer-rated rapport in interactions between medical students and standardized patients, Patient Educ. Couns 76 (2009) 323–327. 10.1016/j.pec.2009.05.009. [PubMed: 19545973]

[29]. Mercer SW, Maxwell M, Heaney D, Watt GC, The consultation and relational empathy (CARE) measure: development and preliminary validation and reliability of an empathy-based consultation process measure, Fam. Pract 21 (2004) 699–705. 10.1093/fampra/cmh621. [PubMed: 15528286]

[30]. Hall JA, Horgan TG, Murphy NA, Nonverbal Communication, Annu. Rev. Psychol 70 (2019) 271–294. 10.1146/annurev-psych-010418-103145. [PubMed: 30256720]

[31]. Hall JA, Roter DL, Rand CS, Communication of affect between patient and physician, J. Health Soc. Behav 22 (1981) 18–30. [PubMed: 7240703]

[32]. Henry SG, Penner LA, Eggly S, Associations between thin slice ratings of affect and rapport and perceived patient-centeredness in primary care: Comparison of audio and video recordings, Patient Educ. Couns 100 (2017) 1128–1135. 10.1016/j.pec.2016.12.020. [PubMed: 28087212]

[33]. Street RL, Buller DB, Patients' Characteristics Affecting Physician-Patient Nonverbal Communication, Hum. Commun. Res 15 (1988) 60–90. 10.1111/j.1468-2958.1988.tb00171.x.

[34]. Street RL, Gordon H, Haidet P, Physicians' communication and perceptions of patients: is it how they look, how they talk, or is it just the doctor?, Soc. Sci. Med 1982. 65 (2007) 586–598. 10.1016/j.socscimed.2007.03.036. [PubMed: 17462801]

Highlights:

- Improvements in GERD symptoms were associated with increased patient-centeredness

- Patient smiling and appearing pleased were associated with symptom improvement

- Integrative clinicians' history taking process may enhance patient-centeredness.

- Thin slice analysis can be used to assess integrative medicine consultations

Table 1:

Baseline Characteristics of Study Participants

	Standard (n=11)	Integrative (n=10)
Mean age (SD)	61.5 (11.2)	56.3 (8.6)
# Female	7	6
# White	7	5
Mean BMI (SD)	30.0 (10.1)	29.2 (6.9)
# Current Smoker	2	1
# Using Proton Pump Inhibitors	4	2
# Using H2 Receptor Blockers	1	3

Table 2:

Correlation of Global Impressions and Nonverbal Behaviors with GERD Symptom Response

	GERD Symptom Response		
	Beginning	**Middle**	**End**
Impressions	r	r	r
Engaged MD	0.265	0.347	0.426
Friendly MD	0.598[**]	0.508[*]	0.564[**]
Relaxed MD	0.655[**]	0.581[**]	0.471[*]
Empathic MD	0.426	0.363	0.555[**]
Business-like MD	−0.401	−0.247	−0.512[*]
Dominant MD	−0.207	0.116	−0.317
Reciprocity	0.490[*]	0.474	0.291
Engaged PT	0.478[*]	0.302	0.456[*]
Friendly PT	0.494[*]	0.548[*]	0.669[**]
Relaxed PT	0.298	0.289	0.386
Confident PT	0.060	−0.081	0.119
Pleased PT	0.556[**]	0.379	0.709[***]
MD Behaviors			
Gaze #	0.176	0.016	0.291
Gaze Duration	0.043	0.467[*]	0.028
Smile #	0.549[*]	0.583[**]	0.563[**]
Smile Duration	0.470[*]	0.532[*]	0.501[*]
Nods	−0.040	−0.043	−0.124
Self-Touch	−0.353	0.366	−0.176
Gestures	0.104	0.301	−0.006
Time MD	−0.084	0.330	0.148
MD Backchannels	−0.029	−0.003	−0.160
Shared Laughs	0.371	0.393	0.393
PT Behaviors			
Gaze #	−0.041	0.224	0.251
Gaze Duration	−0.060	0.109	0.139
Smile #	0.438[*]	0.259	0.556[**]
Smile Duration	0.500[*]	0.470[*]	0.549[*]
Nods	0.286	0.490[*]	0.635[**]
Self-Touch	0.220	0.216	0.329
Gestures	0.369	−0.056	0.119
Time PT	0.217	−0.009	−0.068

r = correlation coefficient. MD = Physician. PT = Patient. # = number.

*
 p < 0.05.

**
 p <0.01.

***
  p < 0.001.

Table 3:

Both Physician and Patient Smiling are Associated with GERD Symptom Improvement

Variable	Time	Model r^2	Model p	Beta	p
MD smile #	Beginning	0.341	0.023	0.440	0.059
PT smile #				0.228	0.310
MD smile #	Middle	0.389	0.012	0.809	0.006
PT smile #				−0.317	0.243
MD smile #	End	0.452	0.004	0.410	0.044
PT smile #				0.399	0.049

MD = Physician. PT = Patient. # = number. r = correlation coefficient. p = p value.

Table 4:

Global Impression Ratings

Variable	Intervention	Beginning		Middle		End		p values		
		Mean	SE	Mean	SE	Mean	SE	Time	Intervention	Time x Intervention
Engaged MD	S	5.3	0.45	4.7	0.46	5.2	0.40	0.15	0.009	0.20
	E	5.8	0.47	6.1	0.49	7.1	0.42			
Friendly MD	S	2.7	0.47	3.2	0.55	3.0	0.38	<0.001[a]	0.005	0.001[a]
	E	3.0	0.50	5.2	0.58	6.1	0.40			
Relaxed MD	S	4.0	0.46	3.9	0.34	4.3	0.39	0.02[a]	0.002	0.09[b]
	E	5.1	0.49	6.2	0.35	6.2	0.41			
Empathic MD	S	2.9	0.37	3.5	0.45	4.7	0.45	<0.001[a]	0.10	0.18
	E	3.0	0.39	5.0	0.47	5.6	0.47			
Business-like MD	S	5.3	0.42	6.4	0.48	6.7	0.44	0.13	0.03	0.01[a]
	E	5.1	0.44	5.7	0.50	4.4	0.46			
Dominant MD	S	3.6	0.58	3.8	0.45	4.4	0.56	0.20	0.28	0.03[b]
	E	4.2	0.61	5.6	0.48	4.1	0.59			
Reciprocity	S	4.3	0.46	4.6	0.46	5.3	0.40	0.009[a]	0.08	0.99
	E	5.3	0.48	5.6	0.48	6.3	0.42			
Engaged PT	S	4.5	0.56	5.7	0.44	5.7	0.56	0.07	0.23	0.82
	E	5.6	0.59	6.4	0.46	6.2	0.58			
Friendly PT	S	2.5	0.66	3.7	0.62	2.8	0.41	<0.001[a]	0.07	0.002[a]
	E	2.7	0.69	4.8	0.65	5.7	0.43			
Relaxed PT	S	4.8	0.60	5.9	0.50	5.5	0.45	0.01[a]	0.87	0.21
	E	4.8	0.63	5.5	0.53	6.3	0.47			
Confident PT	S	5.2	0.52	6.5	0.42	5.8	0.42	0.03[a]	0.48	0.15
	E	4.9	0.54	5.6	0.44	5.9	0.45			
Pleased PT	S	4.0	0.48	5.2	0.45	5.1	0.38	<0.001[a]	0.26	0.04[a]
	E	4.3	0.50	5.4	0.47	6.7	0.40			

MD = Physician. PT = Patient. # = number. S = Standard. E = Expanded. SE = standard error. P values are omnibus values except where noted as

[a] linear effect or

[b] quadratic effect.

Table 5:

Nonverbal Behaviors

Variable	Intervention	Beginning		Middle		End			p values	
		Mean	SE	Mean	SE	Mean	SE	Time	Intervention	Time x Intervention
MD Gaze #	S	9.9	0.69	7.2	0.86	7.8	0.63	<0.001[a]	0.40	0.49
	E	10.2	0.72	8.8	0.91	7.5	0.66			
MD Gaze Duration	S	48.8	3.35	27.5	4.97	49.7	6.11	<0.001[b]	0.02	0.003[b]
	E	54.1	3.51	52.8	5.21	58.5	6.41			
MD Smile #	S	0.9	0.43	0.4	0.24	1.3	0.25	<0.001[b]	0.006	0.14
	E	1.7	0.45	1.4	0.25	3.0	0.26			
MD Smile Duration	S	3.3	1.59	2.0	1.99	6.5	2.66	<0.001[a]	0.006	0.004[a]
	E	4.7	1.67	8.1	2.09	20.7	2.79			
MD Nods #	S	8.4	0.70	10.2	1.01	12.2	1.52	0.17	0.29	0.16
	E	9.8	0.74	8.8	1.06	9.7	1.21			
MD Self-Touch	S	2.0	0.30	0.7	0.40	0.5	0.17	<0.001[a]	0.75	0.14
	E	1.7	0.32	1.5	0.42	0.4	0.18			
MD Gestures	S	3.3	0.43	0.9	0.55	1.9	0.36	<0.001[a]	0.007	0.038[b]
	E	3.7	0.45	3.5	0.58	1.9	0.37			
Time MD	S	33.4	3.09	16.9	4.70	19.0	3.33	<0.001[a]	0.02	0.046[b]
	E	36.2	3.24	36.8	4.93	21.6	3.49			
MD Backchannels	S	7.3	0.86	9.3	0.93	12.5	1.13	0.04[a]	0.03	0.02[a]
	E	7.4	0.90	8.3	0.97	7.1	1.19			
Shared Laughs	S	0.3	0.15	0.2	0.22	0.5	0.23	<0.001[a]	0.06	0.001[a]
	E	0.1	0.15	0.7	0.23	1.6	0.24			
PT Gaze #	S	10.5	1.30	9.6	1.21	9.0	1.04	0.73	0.19	0.53
	E	11.5	1.36	11.9	1.27	11.8	1.10			
PT Gaze Duration	S	47.9	5.34	51.3	6.70	40.6	5.27	0.06	0.29	0.61
	E	51.0	5.60	60.4	7.03	51.4	5.53			
PT Smile #	S	1.1	0.46	1.0	0.42	1.4	0.42	0.003[a]	0.04	0.01[a]
	E	1.6	0.48	1.5	0.44	3.7	0.44			
PT Smile Duration	S	3.1	1.66	3.3	1.66	4.9	2.85	0.001[a]	0.004	0.004[a]
	E	4.4	1.74	7.3	1.75	20.8	2.99			
PT Nods #	S	6.2	0.80	4.6	1.00	5.1	0.84	0.62	0.42	0.21
	E	6.0	0.84	6.6	1.05	6.0	0.88			
PT Self-Touch	S	4.6	1.05	3.4	0.53	6.2	0.79	0.004[b]	0.95	0.51
	E	4.9	1.10	3.8	0.55	5.4	0.82			

		Beginning		Middle		End			p values	
Variable	Intervention	Mean	SE	Mean	SE	Mean	SE	Time	Intervention	Time x Intervention
PT Gestures	S	7.0	1.90	10.5	1.85	10.7	2.05	0.51	0.68	0.22
	E	9.1	1.99	7.3	1.94	9.0	2.16			
Time PT	S	67.5	5.90	61.6	6.60	71.8	5.79	0.13	0.24	0.55
	E	65.3	6.19	52.2	6.93	58.7	6.08			

MD = Physician. PT = Patient. # = number. S = Standard. E = Expanded. SE = standard error. P values are omnibus values except where noted as

[a]linear effect or

[b]quadratic effect.