Research Article

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Journal of Healthcare Communications
ISSN 2472-1654

2018
Vol.3 No.S1:9

DOI: 10.4172/2472-1654.100120

An Intervention Study of Clinician-Patient Nonverbal Interactions and Patient Perceptions of Visits

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Citation: Montague E (2018) An Intervention Study of Clinician-Patient Nonverbal Interactions and Patient Perceptions of Visits. J Healthc Commun Vol.3 No.S1:9

Abstract

The aim of this study is to characterize the effects of specific clinician nonverbal behaviors on patient nonverbal interaction and perceptions of clinicians. A randomized controlled trial was conducted to evaluate the effects of clinician training on improving patient perceptions of the clinical visit. Two hundred and seventy one patients saw clinicians that they had no prior relationship with for cold symptoms. The clinicians were trained to interact with patients in either "standard" (type A) or "enhanced" (type B) mode as expressly defined by this study. They were randomly assigned to interact with the patient in one of these two conditions. In the enhanced condition, clinicians made efforts to create rapport by patient-oriented talk and positive nonverbal behaviors such as making eye contact. The encounters were videotaped and the nonverbal interactions were analyzed. The results of this study show that the training of enhanced behaviors was successful in increasing the clinicians' amount of specific positive nonverbal behaviors in the encounter. Additionally, when clinicians engaged in certain culturally recommended rapport-building nonverbal interactions such as, but not limited to, eye contact, they were able to positively influence patient nonverbal behaviors and patient perceptions of clinicians. Results of this study could be used to develop training for physicians and to determine how technologies should be designed to facilitate positive interpersonal interactions in health encounters. If eye contact is important to rapport-building and ultimately to improved health outcomes, then technologies should support and not impede such nonverbal cues.

Keywords: Health outcomes; Nonverbal behaviors; Patient perceptions; Health encounters

Received: November 08, 2017; **Accepted:** November 20, 2017; **Published:** November 30, 2017

Introduction

In health care, the relationship between clinician and patient often must be built in a short amount of time despite the ill-defined roles of patients and providers in contrast to other types of teams. For example, patients may view themselves as participants in the encounter, in control of the encounter, or as products without power in the system. Literature suggested that the patient clinician relationship could be significantly influenced by interpersonal interaction, especially nonverbal communication [1,2]. However, the amount of empirical studies on nonverbal interactions skills and trainings in health care is far less than its verbal counterpart [1,3,4]. This paper describes a study that evaluated the effects of behavioral training on clinicians' nonverbal interactions in clinical encounters and interpersonal relationship formation in patient/clinician teams.

Patient perceptions of health encounters

Patient perceptions of health encounters are related to many clinically important system and health outcomes. For example, positive perceptions are related to adherence to medical advice [5] and pursuit of follow-up care [6]. Studies found patient perceptions of clinicians correlate with quality indicators such as sustained enrollment in health plans [7], patient satisfaction [8,9], utilization of preventive services [10,11], adherence to medical advice [5], low rates of malpractice litigation, improved health status, and health service seeking behaviors [12]. Patients' perception of their clinician is also linked to important

organizational and economic factors such as decreases in number of patients exiting from health care practices and withdrawal from health plans [13].

Nonverbal behavior in communication

Nonverbal behavior plays a critical role in communication, especially in communication of emotion [14,15]. People may put more emphasis on nonverbal cues than verbal cues for detecting emotional information [16-19]. Described functions of nonverbal behavior include cues for deception [20,21], expressions of power [22], and interpersonal relationship building [23].

Nonverbal behaviors have been studied in many human interactions including close relationships [24], education communication [25], computer-mediated communication [26], and intercultural communication [27]. Relatively little attention has been paid to the nonverbal behaviors in clinician-patient interaction [1,3,4,28].

Nonverbal behavior in clinician patient interaction

While clinicians have multiple technologies for diagnosing and treating patients, they still need to use interpersonal communication as the primary method of exchanging information with the patients [29,30]. For the patient, the quality of the communication with the clinician may influence medical visit outcomes including visit satisfaction [31,32], adherence to prescribed therapy, understanding, trust, and even health status [29]. Specifically, the development of trust-bond between a care provider and a patient could be significantly facilitated by nonverbal communicated care and concern [15]. Since people tend to please those whom they like and trust [33], a patient is more likely to adhere to the medical recommendation of a trusted care provider [34] and better medical outcome is expected.

Empirical evidence supports the effect of various kinds of nonverbal behavior on outcomes of the medical visit. For example, Bensing's study [35] showed that nonverbal affective behaviors seem to be the most important factors that influence the satisfaction of the patient with the clinician, and nonverbal attention (operationalized as clinician gaze at patient) was the strongest indicator for that. Patients' perceptions of the clinician in terms of empathy, interest, and warmth are associated with whether the clinician faced to the patient directly, made a moderate level of eye contact, and maintained an arm posture that indicates readiness to act [36]. Certain nonverbal behaviors including touching, forward lean, and body orientation were associated with higher patient satisfaction. Others including backward lean and neck relaxation were associated with lower patient satisfaction [37]. Objective measures of the clinician's nonverbal communication skills including emotion expressiveness and nonverbal sensitivity were related to patient satisfaction and compliance [38,39].

A variety of methods have been used to explore the role of nonverbal behavior in clinician patient interactions. Duggan and Parrot [40] coded the frequency of nonverbal behaviors and the amount of information that the patient disclosed in 34 interactions with 12 different physicians. Results showed that smile and head nodding were positively correlated with patients' information disclosure, while indirect eye contact, leaning backward, and shoulder turning had a negative effect on patient information disclosure. Forty-eight interactions were videotaped and coded in a recent study of non-verbal behaviors during the clinician encounter [41]. Frequency of facial expressiveness (including smiling, nodding and frowning) and distancing behaviors (including not smiling and looking away) showed significant positive and negative impacts on geriatric patients' short-term and long-term health outcomes (measured as physical and cognitive functioning).

In another study [42], positive nonverbal behavior was positively correlated to reported satisfaction level from standardized patients. Ishikawa et al. [43] used a similar method to analyze 89 medical interviews and found that nonverbal behavior affected patients' perception about the visit independently of the interview content.

In another study [44], 11 medical visit videos were shown to 163 standardized patients, for evaluation of their satisfaction with the physician. The study found that for optimal satisfaction of these standardized patients, female and male clinicians should follow different nonverbal behavior patterns which relate to gender roles; for example, the patients preferred more gazing and softer voice by female clinicians, *versus* a preference for more distance and louder voice by male clinicians.

Description of the Current Study and Justification for Methods

The study described in this paper validated an intervention to enhance physician nonverbal interactions such as eye contact in clinical encounters. This study is important because it will inform communication training for health care providers. For example, Pearson and Raeke [12] stated that successful interventions for interpersonal trust in clinical encounters have not been documented; however, effective behavioral training for care providers may enhance their interaction with patients thus improve trust. In addition, this study could give direction for the development of design guidelines for information and communication technologies used in clinical practice. These technologies are sensitive to the role of nonverbal interactions in effective interpersonal communication. For example, the use of electronic health record (EHR) system during clinical encounter may hinder clinician's communication with the patient [45,46]. Computer use may also change the way clinicians communicate with patients by encouraging reduced eye contact and closed communication body postures [47].

This study used video observation data of patient-provider encounters to increase the ecological validity of the findings and allow for detailed analysis of implicit and explicit interactions. The enhanced objectivity allows the analysis to move beyond patient perceptions and self-report of the encounter.

Research questions

1. Did clinicians have improved nonverbal communication interactions with patients after a training intervention?

2. Did different interaction modes of a clinician affect patient perceptions of visit and clinician?

Methods

Study design

The data set was derived from videotaped clinical encounters of research participants with acute upper respiratory infection (common cold) [48]. Patients with new onset colds were recruited from the community through newspaper advertisements, community talks, posters, direct mailings, emails, and word-of-mouth [49,50]. The prospective participants would call an advertised phone number and be screened for eligibility. The eligible participants would be met in person for informed consent. The participants then interacted with clinicians as part of a randomized controlled trial testing possible effects of placebo and clinician patient interaction [48]. Participants were randomly assigned to group A (clinicians used standard interaction mode or type A), group B (clinicians used enhanced interaction mode) and group C (no clinical encounter). The randomization was first generated using SAS 8 program. For group A and group B, envelopes containing interventions groups were prepared and distributed to clinicians before the day of the patient visit. Prior to the visit, the clinician learned the patient's assignment by opening the envelope immediately before entering the examination room [51]. Clinical encounters took place in two locations in Dane County, Wisconsin between April 2004 and February 2006. Institutional review board approval was obtained from both the University of Wisconsin School of Medicine and Public Health and clinical review boards. All Health Insurance Portability and Accountability Act (HIPAA) regulations were followed to protect patient rights and privacy.

Clinician training intervention

The training intervention aimed to train clinicians to interact with patients using either standard interaction mode (type A) or enhanced interaction mode (type B) [48]. The standard interaction mode (type A) required clinicians to behave according to customary standards of medical practice. This interaction mode included four attributes: illness presentation, brief symptom-directed physical exam, diagnosis statement and brief treatment plan. Five additional attributes were included to develop the enhanced interaction mode (type B): education [28], empathy [52], empowerment [53], positive prognosis [54], and connectedness [55]. The enhanced interaction mode contained these attributes because their effects on patient outcome were considered significant in previous studies. In this study, education was achieved by offering educational information regarding common cold to patients, in addition to providing instructions for self-care and other personalized comments. Empathy was achieved by attentive listening and responding to patient concerns. Empowerment was achieved by stating that the patient's effort could have an effect on their health outcomes. Positive prognosis was achieved by stating that the patient would get better soon. Connectedness was achieved with increased eye contact, handshake greeting, humor, and interactive discussion.

All the clinicians who participated in the study received training from a medical anthropologist who also has experience as a film and play director. The training lasted several months. The performance of the clinicians in different modes were refined by first interacting with each other through role-play, then interacting with mock patients, finally interacting with real patients with cold symptoms. After the training, there was a final testing where each clinician enacted three type A and three type B encounters with real patients. A review that was blind to the study design reviewed the videotapes of the encounters and rated on the 5 attributes. The testing showed that the 5 attributes were all represented in type B encounters but not in type A encounters as intended. Readers could refer to the paper by Barrett et al. [48] for additional details of the intervention. To validate the fidelity of the intervention components, each video was coded by at least two observers who were not familiar with the study aims. Subjective assessment of the videos indicated that observers found aspects of the intervention to be higher in the type B encounters then compared to type A.

Sample

The sample for the larger study included 719 patients and 6 clinicians. The sample sizes for group A, B and C were 246, 237, and 236, respectively. For patients in groups A and B, 286 of the 483 medical encounters were videotaped. The video camera was mounted on the upper corner of the examination room; 15 of the videos were not analyzable due to poor camera positioning (either the patient or the clinician was out of camera range). summarizes the analysis of the remaining 271 videos (142 from group A and 126 from group B).

Among the 271 patients in the analyzed videos, age ranged from 12 to 72 years. The patients consisted of 103 (38.0%) male and 168 female (62.0%) patients. 244 (90.0%) participants were White/Caucasian. More than half of participants had graduated from college or had postgraduate education. 29% of patients indicated a household income lower than $25,000, and 22 (8.1%) did not answer this question in the survey. Represents the detailed demographic data about the participants in the analyzed videos.

Five family physicians (three male and one female) and one nurse practitioner (female) participated in the study. All the clinicians were White/Caucasian. Each clinician took training from an acting coach to build reproducible behavior patterns for standard and enhanced encounters. All analyzed encounters involved different patients (n=271). One of the clinicians was involved in only three encounters (all enhanced) and their data was excluded from the data set, while the remaining five clinicians were involved in at least 24 encounters each, with a minimum of 10 encounters of each type for each clinician. Patient perceptions of the visit were assessed with two survey items, that were administered by paper after the visit, asking how much they liked the clinician and how connected they felt to the clinician. The items were, "How much did you like this doctor?" and "How connected did you feel to him/her?" The scales ranged from "Very little" to "Very much."

Analysis

Each video was coded in its entirety. Start and stop times for each item were extracted for subject, behavior, and object combinations for each encounter. These data were graphed over

the time period of the encounter. Encounters were divided into activities that took place in the encounter (pre-exam interview, examination and post-examination interview).

Video coding: Nonverbal interactions were quantified using a video-based observational coding scheme. Coding is a well-utilized technique in observational research in health and human factors where aspects of an encounter between one or more individuals are broken down into identifiable units [56]. In this study measureable units were nonverbal behaviors. A team of four researchers was trained to conduct the coding procedure. Two lead coders developed the coding scheme, led trainings for all coders and conducted reliability checks for the additional coders.

Coding scheme: The coding scheme was designed using the Noldus Observer XT software systems coding platform. Please refer to for a description for the coding scheme and definitions of its components. Each activity was coded from beginning to end in the video. Coders watched each video multiple times to code an event. Events sometimes overlapped if they belonged to different behavior categories. Codes were later combined to create additional variables. For example, overlaps of patient gaze at clinicians and clinician gaze at patient were coded mutual gaze, also known as eye contact.

Reliability: When a coder coded an event at a specific time (X), if the other coder gave the same code in the period of X ± 1 second, it was counted as agreement; if the coder gave a different code or did not code anything, it was counted as disagreement [57]. The Cohen's Kappa coefficient was used to evaluate reliability.

Reliability measures were collected, with the goal of >0.60 [58]. Coders were trained before starting the analysis to ensure they were able to reliably code events in the same way. During training, each coder coded five videos to ensure appropriate reliability before moving forward. After coding and reliability standards were met, the coding team met weekly to discuss the coded videos and address coding questions to maintain reliability. Also for each week, one video was assigned to be coded by all four coders for reliability check. The average value of Cohen's Kappa coefficient of all the reliability check videos was between 0.67 and 0.77.

Statistical analysis: Effect of visit type on total visit duration and duration of visit phases (pre- exam, exam, and post-exam) was estimated by means of a mixed model incorporating a fixed visit type effect and a random physician effect. Similar mixed effects models were used to estimate visit type effect on gaze duration overall and by phase (expressed both absolutely and as a percentage of phase) and patient perception of visit as measured by survey tools. Absolute durations were log- transformed to approximate normality, and where observed durations were zero, a small offset (half the smallest observed duration) was added to the response; all other response variables were used without transformation.

Results

Visit length

The total duration of the visit was longer for type B (enhanced) than type A (standard). Observed median visit time was 465 seconds (7 minutes and 45 seconds) for type B *versus* 199 seconds (3 minutes and 19 seconds) for type A.

The data was fitted to linear mixed effects (LME) model for statistical analysis. An LME model is similar to a linear model in that it contains fixed effects with linear parameters, but it also contains random effects to account for non-independence in variance [59]. In this case, the clinician's effect was accounted for in the model as a random effect. The results of the LME model fit suggested that type B visits were 2.3 times longer than type A visits ($p < 0.001$). By visit phase, type B visits had a 1.91 time longer pre-exam phase, a 1.49 time longer exam phase, and a 7.36 times longer post-exam phase compared to type A visits ($p<0.001$ for each).

Gaze

Clinician gaze time at the patient was greater for type B than type A visits, both in absolute duration and as a percentage of the visit. Observed median clinician-to-patient gaze duration was 261 seconds for B *versus* 41 seconds for A, and the observed median percentage of total visit time the clinician spent gazing at the patient was 55% for B *versus* 21% for A. The LME model estimated clinicians spent an additional 62% of the pre-exam phase, 14% of the exam phase, and 13% of the post-exam phase gazing at the patient for type B visits *versus* type A visits ($p<0.001$ for each estimate).

Similarly, time spent by the patient gazing at the clinician was greater for type B than type A visits, both in absolute duration (median of 200 *versus* 46 seconds) and as a proportion of the visit (43% *versus* 24% of visit duration). The LME model estimated patients spent an additional 32% of the pre-exam phase and 13% of the exam phase gazing at the clinician for type B *versus* type A visits ($p<0.001$ for each estimate). Notably, for type B visits *versus* type A visits, patients spent 15% less of the post-exam phase gazing at the clinician ($p<0.001$), but this translated into 5.82 times more gaze time because of the longer post-exam phase duration ($p<0.001$).

Time spent in mutual gaze, defined as simultaneous clinician-to-patient and patient-to-clinician gaze was higher in type B *versus* type A visits: an additional 53% of the pre-exam phase ($p<0.001$), an additional 10% of the exam phase ($p<0.001$), and an additional 6% of the post-exam phase ($p=0.012$) was spent in mutual gaze for type B visits.

Perceptions of visit

Patients indicated more connectedness to of their clinicians for type B (*M*=3.95 *SD*= .9) *versus* type A visits (M=2.87 SD=1.1) and more liking of their clinicians for type B (M=4.51 SD= .65) *versus* type A visits (M= 3.6 SD= .9). The LME model estimated patients' connectedness scores were 0.97 units higher and liking scores were 0.85 units higher on five-point scales for type B

versus type A ($p<0.001$ for each). In particular, 28% of patients gave their clinicians a maximum connectedness score of 5 out of 5 for B *versus* 8% for A, and 60% of patients gave their clinicians a maximum liking score of 5 out of 5 for B *versus* 24% for A.

Discussion

This study documents that encounter training can have a substantial impact on both clinician nonverbal and verbal behaviors. Further, this difference in gaze behavior was associated with patients' reported of liking and connectedness with clinicians. Clinicians with patients in the type B condition spent more time looking at patients during pre-exam and post exam, than clinicians with patients in the type A condition. Further, the B condition patients reported more frequent maximum liking and maximum connectedness with the clinicians. Although research has suggested that communication training could benefit patient satisfaction [39] and a meta-analysis found that communication training programs could also improve patient adherence [60]. Our results also suggest that clinician training could affect patient perceptions of encounter. The ability to train clinicians to effectively change nonverbal characteristics is a promising finding toward development and implementation of trust enhancing interventions.

The results show that some patients had low levels of clinician-to-patient gaze in the pre-exam period and higher than expected percentages of patient-to-clinician gaze. This may indicate that, even though clinicians were not initiating or returning gaze, patients were trying to initiate eye contact with clinicians. In terms of the percentage of the post exam period gaze, type A visits were more dispersed than expected in terms of percent of time spent in clinician to patient gaze. Most of the visits were clustered around <40% eye contact, but with a range up to 70%. Variation was also observed in patient-to-clinician gaze with some visits with none and some >80%. It is possible that if patients do not receive the level of gaze they want, they initiate gaze behaviors to elicit greater gaze behavior from their clinicians. If the clinician fails to response the patient's gaze, it may negatively affect the interaction process. A previous finding that in some context, if a clinician disengages from eye contact and focuses on reading or writing medical records, the patient would perceive this behavior as problematic [61]. Part of clinician training can be to alert clinicians to patient gaze cues that suggest a desire for a more connected gaze. This is also important for facilitating the verbal communication process as patient-direct gaze is a significant facilitator for patient's verbal participation [62,63].

Limitations

The strengths of this study are that it involves a relatively large sample from a single community. The patients were being seen for the same illness and were seen by a clinician they did not have an existing relationship with. These strengths may also be limitations as the results may not be generalizable to other health domains where the interactions may differ and where patients have ongoing relationships with clinicians.

One limitation was that the intervention utilized the same clinicians to deliver both interventions. Although extensive training was conducted for the clinicians to behave in different behavior modes, lack of blinding could potentially affect the outcome of the interaction [64]. Secondly, the study was conducted in one region with a relatively homogenous population. It will be important to conduct similar studies with diverse cultural groups who may have different norms for gaze and other nonverbal behaviors. Studies that manipulate interaction style should be concerned about unmeasured variables that may have had impact. For example, the enhanced visits may have had more smiling and other indications of warmth. Even though such behaviors were not specifically included in the intervention protocol, it is unclear whether the providers could control all aspects of their interaction while varying only the trained behaviors. Finally, the sample of providers was relatively small, future studies should include a larger number of care providers. Ultimately, effective clinician training should encourage heightened concordance and responsiveness to individual differences in such norms.

Future Work in this Area

Future work in this area should explore interaction interventions in systems that include technologies such as computers and other devices. Future work should also explore the effectiveness of these interventions in other health settings such as environments where patient care seeking behaviors and related outcomes are low. Additionally, these methods may be particularly important for clinicians who serve very distrustful patient populations. Finally, future work should evaluate the relationship between interpersonal interventions and health outcomes; specifically, do such interventions help people have a greater sense of self-efficacy, and improved health status?

Conclusion

This study indicates that nonverbal cues in health encounters, such as gaze, may be more important than previously thought. Enhancement of these interactions may be important as the role of technology in health care increases. Training interventions have the potential to increase quality outcomes such as patient perception of health clinician and system.

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