

# Improving perceptions of empathy in patients undergoing low-yield computerized tomographic imaging in the emergency department<sup>☆</sup>

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## ABSTRACT

**Objective:** We assessed emergency department (ED) patient perceptions of how physicians can improve their language to determine patient preferences for 11 phrases to enhance physician empathy toward the goal of reducing low-value advanced imaging.

**Methods:** Multi-center survey study of low-risk ED patients undergoing computerized tomography (CT) scanning.

**Results:** We enrolled 305 participants across nine sites. The statement “I have carefully considered what you told me about what brought you here today” was most frequently rated as important (88%). The statement “I have thought about the cost of your medical care to you today” was least frequently rated as important (59%). Participants preferred statements indicating physicians had considered their “vital signs and physical examination” (86%), “past medical history” (84%), and “what prior research tells me about your condition” (79%). Participants also valued statements conveying risks of testing, including potential kidney injury (78%) and radiation (77%).

**Conclusion:** The majority of phrases were identified as important. Participants preferred statements conveying cognitive reassurance, medical knowledge and risks of testing.

**Practice implications:** Our findings suggest specific phrases have the potential to enhance ED patient perceptions of physician empathy. Further research is needed to determine whether statements to convey empathy affect diagnostic testing rates.

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## What is known about this topic:

- Enhanced empathy can improve outcomes in chronic disease management, but little is known about the effect of empathy in reducing unnecessary imaging in emergency care.

## What this adds:

- In a multicenter study, we measured the preferences of emergency department patients undergoing computerized tomographic for 11 phrases designed to increase empathy.
- Patients preferred phrases that emphasize cognitive reassurance and attention to the patient as a whole person. These findings were consistent for patients who had either low or high trust in physicians and perception of physician empathy.

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## 1. Introduction

Nearly 20% of all Emergency Department (ED) patients in the United States undergo computerized tomography (CT) scanning, often with intravenous contrast, a large proportion of which do not change acute management [1]. About one-third of all patients who have a negative CT scan return to the ED and have another negative CT scan within 6 months [2–6]. In prior work, clinicians indicate a near zero gestalt pretest probability for about 5% of all CT scans they order [7]. Possible reasons for this include fear of serious diagnosis, medical malpractice risk, concern about patient satisfaction, and the desire to conform to normative behavior of their peers [8–11].

One potential solution to reduce anticipated negative CT scanning is to increase empathic communication between clinicians and patient. Empathy in health care has been defined as “the competence of a physician to understand the patient’s situation, perspective, and feelings; to communicate that understanding and check its accuracy; and to act on that understanding in a helpful therapeutic way” and has been shown to improve patient understanding of their condition, increase trust, and impart the perception of compassion [12–14]. Empathy can be improved by multiple non-verbal and verbal methods, but clinicians must use words that patients perceive as empathic to create empathy [15,16]. Clinician understanding and utilization of empathy in the patient encounter may lead to increased patient satisfaction and decreased resource utilization, particularly CT scanning, in the ED.

Our project seeks to develop and validate tailored phrases (to develop a “script”) as part of a larger teaching tool to enhance the providers’ empathy for their patients. The first step in the development of an empathy tool is to identify phrases that are important to patients regarding imaging. The overarching humanistic goal of the work is to improve the relationship between emergency physicians (EP) and their patients to increase the likelihood that patients seeking emergency care will feel satisfied and genuinely cared for during their ED visit. The pragmatic goal of this work seeks to address the epidemic of over-testing with CT scanning in the emergency setting, as evidenced by rising rates of imaging without associated improvements in outcomes. A strategy to increase the perception of empathy in the patient and the provider may play a role in decreasing unnecessary diagnostic imaging. We present findings from a multicenter pilot study to compare phrases aimed at enhancing patient perception of physician empathy.

## 2. Methods

We performed a prospective nine-center cross-sectional survey study by recruiting a convenience sample of adult ED patients undergoing CT of the head, chest, or abdomen as part of usual care. We chose the sites to represent a wide variation in geography and patient demographics.

### 2.1. Study population and enrolment

Inclusion criteria required adult patients (>17 years) without history of trauma undergoing CT scanning of the head, chest or abdomen; patients with isolated minor head injury (no loss of consciousness, Glasgow Coma Scale 15) undergoing CT scanning of the head. The clinician had to agree with the statement “I believe it is unlikely the CT scan will show a true emergency” and that “My workload and overall circumstance with the patient are appropriate for this study”. This step was intended to be respectful to both the clinicians and patients, primarily to avoid tension that might be produced by study procedures and to disclose exclusions that only

the clinician might know. Exclusions included that the patient had CT scanning performed for multisystem traumatic injury (e.g., any trauma alert), evidence of hemodynamic instability, respiratory distress, dementia, intoxication, psychiatric instability, threatening or hostile behavior, severe uncontrolled pain, prior participation, expressed intention to leave against medical advice. The protocol was reviewed and approved by all institutional review boards for the conduct of research in human subjects. At all sites, either written or verbal informed consent was obtained from the patient. Patients were enrolled by trained research coordinators who surveyed the ED in real time for patients undergoing a qualifying CT scan and verified patient eligibility with the ordering clinician. Any patient with a CT scan that showed a disease requiring emergent treatment or admission was considered a screen failure and excluded.

### 2.2. Data collection

Trained research personnel administered a survey of patients’ opinion on 11 phrases, all of which were 20 words or less (see column 1 in Table 2). Research personnel asked the patient to evaluate the relative importance of each phrase based upon his or her perception of the degree to which the phrase “would make you trust your doctor’s estimate of whether you needed to have a CT scan done today.” The content of these phrases were derived by the research team, and were based upon elements known to enhance perceptions of physician awareness, empathy, and cognitive reassurance as well as concepts from the standardized tool we used to assess perception of empathy [13,17–19]. Phrases were grouped into domains indicating: 1) medical knowledge, 2) risks of testing, 3) non-verbal communication; 4) financial concerns; 5) family concerns; and 6) cognitive reassurance/whole person approach (full phrases in Table 2).

For the content development survey, respondents used Likert scales to assess each statement (1 = Strongly Disagree, 5 = Strongly Agree). If needed, study personnel read the statements to the patient and recorded his or her answer. Patients were also allowed to write or verbally state any comments or statements they wanted to hear from their physicians, which were recorded verbatim as free text in the data collection form. To link these responses to patient’s perception of the physician in charge of their care, study personnel showed the patient a photograph of the ED provider, and the patient was instructed to consider that individual when completing the previously validated Jefferson Scale of Patient Perceptions of Physician Empathy (JSPPPE), and the Trust in Physicians Scale (TPS) [19,20]. Study personnel then recorded patient demographics, present and past medical information, CT scan result, and other clinical data on a standardized data collection form, which was transferred to a REDcap database for analysis [21].

### 2.3. Data analysis

We defined complete surveys as those with responses to a majority (at least 6 of 11) content development items. We report survey completion rates among eligible respondents who were approached, and we performed descriptive statistics on all demographic variables. For the primary outcome, we collapsed the top two Likert scores (“Very Important” and “Important”) and bottom three (“Slightly Important” “Mostly Unimportant” and “Totally Unimportant”) responses to create a binary response for ease of comparison. Preplanned subgroup analyses included an examination for possible variation in patient preferences for phrases grouped by patient demographics (age, race, gender), region, and by the highest and lowest quintile for results from the JSPPPE and TPS surveys. We compared subgroup preferences for

each phrase using chi-squared tests. Analyses were performed using Microsoft Excel 2010 and STATA 14.0 (StataCorp). The study protocol was reviewed and determined to be exempt by the institutional review board of each participating institution.

### 3. Results

#### 3.1. Characteristics of study subjects

We approached 344 patients across nine academic medical center EDs from July 1, 2016 until January 31, 2017. Of these, 305 (88.7%) were eligible and completed the survey. The mean age of respondents was 49 years, a majority (55%) were female, and a plurality (44%) self-identified as non-Hispanic white (Table 1).

#### 3.2. Main results

Respondents most frequently rated the statement “I have carefully considered what you told me about what brought you here today” as Important or very important (Fig. 1). Respondents also expressed preferences for phrases related to medical knowledge and risks of testing; the second most frequently preferred phrase related to “vital signs and physical examination,” followed by “past medical problems” and “prior research.” Participants least preferred the phrases related to cost (11th of 11) and family concerns (10th of 11).

#### 3.3. Subgroup analyses

Among nearly all subgroups of age, sex, race, and region, respondents most strongly preferred the statement “I have carefully considered what you told me about what brought you here today” and least frequently preferred the phrase related to cost.

**Table 1**  
Characteristics of Respondents (N = 305).

Variable	Number (%)
Age in years, mean (range)	49 years (range: 18–89)
Female	146 (55.1)
Geographic Region	
South	121 (39.7)
Midwest	90 (29.5)
Northeast	68 (22.3)
West	26 (8.5)
Race/Ethnicity	
Non-Hispanic White	100 (44.3)
Black	74 (33.3)
Hispanic	33 (14.6)
Other	19 (8.4)
Education	
Bachelor's Degree or Higher	78 (30)
Some College	54 (20.8)
High School	84 (32.3)
Less than High School	44 (16.9)
Insurance	
Commercial (HMO, PPO)	91 (35.6)
Medicaid	70 (27.3)
Medicare	51 (19.9)
Self-Pay	36 (14.1)
Other	28 (9.8)
CT Type	
Head	128 (42)
Chest	47 (15.4)
Abdomen	127 (41.6)
JSPPE Score	Median 29 (IQR 24–33)
TIPS Score	Median 65 (IQR 59–71)

\*For all variables, <2% missing except: 47 (15.4%) for Age; 40 (13.1%) for Sex; 79 (25.9%) for Race/Ethnicity; 45 (14.8%) for Education.; 49 (16.1%) for Insurance.

We then compared results between subgroups of patients based on patient perception of provider empathy (JSPPE) and trust (TIPS) (Table 2). Patients who perceived their physicians as highly empathetic (highest quintile of JSPPE) had significantly differing preferences compared to patients who perceived their physicians as least empathetic (lowest quintile of JSPPE)—and indicated a higher relative preference for all phrases except those related to risks of testing and prior research. Table 2 shows a similar distribution of likes and dislikes, regardless of the quintile of JSPPE and TIPS, suggesting linkage between trust and empathy. However, when the total scores of the JSPPE and TIPS were plotted in a first order regression, these two psychometric tests had only modest correlation, as shown by a Pearson's correlation coefficient ( $R^2$ ) of 0.264.

Conversely, there were fewer differences in phrase preferences among highest and lowest TPS quintiles. Patients who expressed low trust in physicians (lowest quintile of TPS) least preferred the phrase related to body language compared to patients who expressed high trust in physicians (highest quintile of TPS).

### 4. Discussion and conclusion

#### 4.1. Discussion

Our multicenter survey of patients undergoing low-risk CT demonstrates patients' relative preferences for specific phrases aimed at enhancing patients' perception of empathy, with the long-term goal of reducing low-yield ED imaging. Overall, respondents across all groups expressed a preference for phrases emphasizing cognitive reassurance and careful consideration of what had brought them into the ED, followed by phrases referring to medical knowledge and evaluation, specifically that ED clinicians had assessed their presenting condition in the context of past medical history, vital signs and physical examination, as well as prior research. To our knowledge, our study is the first to solicit opinions directly from ED patients, in order to increase patient perception of emergency physician empathy. Prior work has shown that interventions to increase empathy can be effective in improving providers' self-perceived empathy [22]. Several studies found a link between physician empathy and positive patient outcomes in the outpatient primary care setting [23]. However, the results in the emergency care setting are more mixed. Melnick et al. found no relationship between physician self-perception of empathy on rates of CT ordering emergency care [24]. Smith et al. found an association between ED physicians' expression of empathy and reduced thoughts of litigation among ED patients [25]. Forstater et al. found an association between patient perception of physician empathy and likelihood of filling a post-ED discharge prescription (Abstract 274, annals of EM 2012). One qualitative study found a discrepancy between patients' and physicians' perceptions of empathy during an ED visit [26].

Although the primary focus of the work is to find phrases associated with increased perception of empathy, we also found linkage with trust. For example, in Table 2 all but two phrases showed like and dislike distributions that matched the lowest and highest quintiles of the JSPPE and the TIPS. In other words, patients who sensed low empathy and trust had lower liking of phrases, and vice versa. The two phrases that were exceptions to this rule were about past medical history and prior research, which had nearly equal appeal across quintiles for trust (but not empathy). One interpretation is this reflects that most patients used separate cognitive processes in assessing trust in their emergency care (largely from the emergency physician's verbal and nonverbal actions that day), versus formulating opinions about past medical problems and prior research, (which are mostly the result of other people's thoughts and actions).

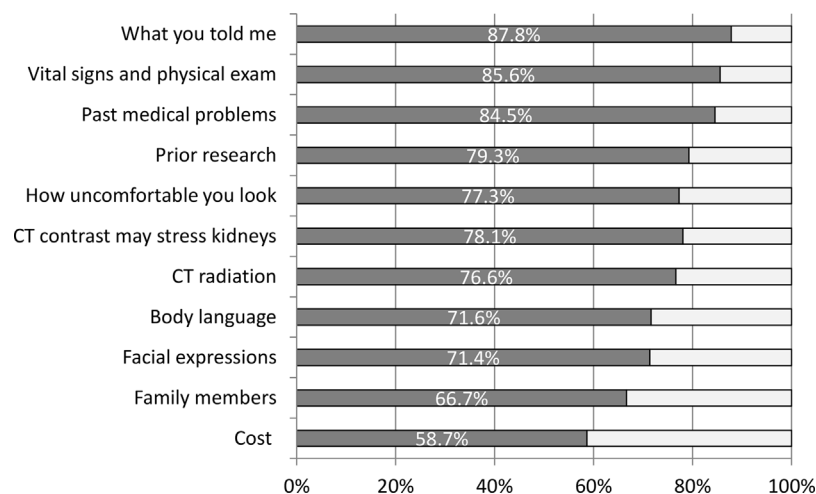
**Table 2**

Importance of Each Phrase to Respondents in Highest and Lowest Quintiles of JSPPE and TIPS (in descending order of importance to all participants).

Phrase	Phrase Important or Very Important (%)			
	Lowest quintile JSPPE	Highest quintile JSPPE	Lowest quintile TIPS	Highest quintile TIPS
I have carefully considered <b>what you told me</b> about what brought you here today'	83.3	96.4*	87.5	91.5
I have thought about your <b>vital signs and physical examination</b>	78.8	92.9*	76.6	88.1
I have thought about your <b>past medical problems</b> and what they mean today	72.3	94.6**	85.7	81.4
I have thought about what <b>prior research</b> tells me about your condition today'	71.2	85.5	84.4	86.2
I have thought about how <b>uncomfortable</b> you look today'	71.2	92.7**	71.4	81.4
The CT scan requires contrast to be injected in your blood, which may put <b>stress on your kidneys</b>	80.3	83.6	76.2	75.9
The CT scan has a lot of <b>radiation</b> which may increase your risk of cancer later in life'	77.3	87.3	71.9	84.5
I have thought about what your <b>body language</b> has told me about how you feel today'	65.2	87.3**	61.3	83.1**
I have considered what your <b>facial expressions</b> have told me about how you feel	65.2	87.3**	61.9	78
I have thought about what your <b>family</b> members have said about your problem	69.2	88.9*	62.9	74.1
I have thought about the <b>cost</b> of your medical care to you today'	53	71.4*	56.3	71.2

\* P &lt; 0.05.

\*\* P &lt; 0.01.

**Fig. 1.** Importance of Each Phrase to All Participants (% indicating Important or Very Important, in descending order of importance).

Our study findings suggest that patients value cognitive more than affective reassurance from their ED physicians. This is consistent with a systematic review of observational studies conducted in primary care settings which showed that cognitive reassurance was more beneficial than affective reassurance for patients with various pain syndromes [27]. The preference for cognitive reassurance may also be unique to the ED setting, given the higher acuity of illness, limited pre-existing patient-provider relationship, and need to gather information and make decisions quickly.

Regardless of their perceptions of their physicians, our patients consistently ranked the phrase referring to financial concerns ("I have thought about the cost of your medical care to you today") as least important to those who expressed high degrees of trust and physician empathy (the top quintile of JSPPE and TIPS). This may be because patients with higher socioeconomic status from non-minority groups are more likely to express trust in medical professionals [28]. This finding is also consistent with a recent study which showed that patients were more willing to discuss costs with physician that they trust. This may be due to patients' concerns related to care rationing.

Respondents' free-text comments suggest that the statement regarding financial concerns is polarizing. Several respondents remarked that discussions of cost are important and overlooked:

"It would be nice to be told about cost. No doctor has ever talked about that" (Table 3), while others expressed distaste: "If you tell me you're thinking about cost, that would seem like you have targeted me as being someone who can't pay." Prior evidence in the outpatient setting suggests most patients would like to discuss out-of-pocket costs with their physicians; however, these conversations occur infrequently [29,30]. Given the bimodal nature of respondent's reactions, bedside discussions about medical costs can be a sensitive discussion and could be initiated with questions such as, "How important is the cost of your medical care to you?" or "Would you like to discuss the cost of your medical care today?" [31].

Other respondent comments indicated a desire to be more involved in the decision-making process, e.g. desire to know more about "alternative options to examine and treat" and desire to be asked for their input "What do you think is the best way for us to treat you?" These responses are consistent with the recent patient engagement movement in emergency medicine.

Our study may be limited by the fact that we enrolled a convenience sample of respondents at academic medical centers—for example, patients from the Northeast, Midwest and South accounted for over 90% of patients. However, study sites were geographically and demographically diverse, and the study population represented the target population of interest: patients



**Table 3**

Comments from Participants.

What other issue would you want your doctor to discuss with you about your condition?
<p>I want to know everything, whether it is good or bad. More information is better</p> <p>If you tell me you are thinking about cost, that would seem like you have targeted me as being someone who can't pay</p> <p>The doctor really needs to build a connection before talking about high risk effects like cancer and kidney damage</p> <p>If they tell me that they realize I look uncomfortable, 'they're taking the time to look at me as a person'</p> <p>It would be nice to be told about cost. No doctor has ever talked about that.</p> <p>Looking at my history helps build trust. Letting me know tells me that you care about me and want to get the full picture.</p> <p>Go over what they are looking for with the CT. Go over plan of care and expected outcomes</p> <p>Ask if treatment is making me feel better, and how I am doing. Doctors don't always do the best job at this.</p> <p>Money is a big concern. I walked to the hospital because I couldn't pay for the ambulance bill</p> <p>Be blunt about risks. Cost is important, but I don't want it to be something the physician talks about</p> <p>The radiation risk is above all else</p>
Are there any other ways to say any of the above statements that would make you feel better?
<p>I know about your medical history and I am going to use it to help me understand better what brings you here today</p> <p>Patient does not care for the physician asking about her family's opinion or prior medical problems unless directly related to current health concern.</p> <p>Like it not scripted and I'm an individual who has feelings</p> <p>Explain the CT scan better (especially the risks of the CT scan)</p> <p>If there's any alternative rather than a CT, and what that would mean in terms of missing possible diagnoses.</p> <p>Convey with sincere tone and concern</p> <p>No, I appreciate directness and information about the process of what needs to happen</p> <p>None of the statements evoked an emotional response. They are logically stated and understood.</p> <p>The cancer one is kind of blunt. Maybe, 'Any prolonged exposure to radiation can increase your risk of cancer.'</p> <p>There was no explanation of what CT scan was, what it involved, etc.</p>

undergoing CT as part of usual care with low likelihood of serious diagnosis. As with any survey study, our findings may have been influenced by response or observer bias, which we attempted to mitigate by using trained non-clinician research coordinators. Other limitations include the potential for acquiescence bias since most respondents reported that the majority of the proposed phrases were important; however, we observed variation in responses, reflecting differing preferences.

#### 4.2. Conclusion

Our multicenter study identified a set of phrases a majority of patients identified as important or very important to hear from their ED clinician. Respondents rated phrases related to cognitive reassurance, medical knowledge and risks of testing as most important. The phrase expressing that ED clinicians had carefully considered what patients had said was most important to all patients. The statement related to cost was identified as less important relative to other statements among most respondents. Our findings may help ED clinicians build rapport with their patients using key phrases, which may in turn lead to a decreased utilization of CT and other advanced diagnostic imaging in low-yield clinical scenarios.

#### 4.3. Practice implications

Our findings suggest specific phrases have the potential to enhance ED patient perceptions of physician empathy. Emergency physician adoption of phrases to convey cognitive reassurance may be particularly helpful in promoting patient perceptions of empathy, and may contribute to decreased rates of negative CT scanning. Further research is needed to determine whether statements to convey empathy affect diagnostic testing rates.

#### References

- [1] QuickStats: Annual Percentage of Emergency Department Visits with Selected Imaging Tests Ordered or Provided—National Hospital Ambulatory Medical Care Survey, United States, 2001–2010 1600 Clifton Road Atlanta, GA: Centers for Disease Control and Prevention; 2013 [updated June 7, 2013/62;455. 22: [Available from: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6222a6.htm>.
- [2] L.B. Feng, J.M. Pines, H.R. Yusuf, S.D. Grosse, U.S. trends in computed tomography use and diagnoses in emergency department visits by patients with symptoms suggestive of pulmonary embolism, 2001–2009, *Acad. Emerg. Med.* 20 (2013) 1033–1040.
- [3] A. Crichlow, A. Cuker, A.M. Mills, Overuse of computed tomography pulmonary angiography in the evaluation of patients with suspected pulmonary embolism in the emergency department, *Acad. Emerg. Med.* 19 (2012) 1219–1226.
- [4] M.B. Levine, A.B. Moore, C. Franck, J. Li, D.R. Kuehl, Variation in use of all types of computed tomography by emergency physicians, *Am. J. Emerg. Med.* 31 (2013) 1437–1442.
- [5] H.G. Welch, K.J. Hayes, C. Frost, Repeat testing among medicare beneficiaries, *Arch. Intern. Med.* 172 (2012) 1745–1751.
- [6] C.T. Berdahl, M.J. Vermeulen, D.B. Larson, M.J. Schull, Emergency department computed tomography utilization in the United States and Canada, *Ann. Emerg. Med.* 62 (2013) 486–494.
- [7] J.A. Kline, W.B. Stubblefield, Clinician gestalt estimate of pretest probability for acute coronary syndrome and pulmonary embolism in patients with chest pain and dyspnea, *Ann. Emerg. Med.* 63 (2014) 275–280.
- [8] D.M. Studdert, M.M. Mello, W.M. Sage, C.M. DesRoches, J. Peugh, K. Zapert, et al., Defensive medicine among high-risk specialist physicians in a volatile malpractice environment, *J. Amer. Med. Assoc.* 293 (2005) 2609–2617 [see comment].
- [9] F.L. Lucas, B.E. Sirovich, P.M. Gallagher, A.E. Siewers, D.E. Wennberg, Variation in cardiologists' propensity to test and treat: is it associated with regional variation in utilization, *Circ. Cardiovasc. Qual. Outcomes* 3 (2010) 253–260.
- [10] H.K. Kanzaria, J.R. Hoffman, M.A. Probst, J.P. Caloyeras, S.H. Berry, Brook RH. Emergency physician perceptions of medically unnecessary advanced diagnostic imaging, *Acad. Emerg. Med.* 22 (2015) 390–398.
- [11] E.R. Melnick, K. Shafer, N. Rodulfo, J. Shi, E.P. Hess, R.L. Wears, et al., Understanding overuse of computed tomography for minor head injury in the emergency department: a triangulated qualitative study, *Acad. Emerg. Med.* 22 (12) (2015) 1474–1483.
- [12] E.R. Melnick, How to make less more: empathy can fill the gap left by reducing unnecessary care, *Br. Med. J.* 351 (2015) h5831.
- [13] T. Pincus, N. Holt, S. Vogel, M. Underwood, R. Savage, D.A. Walsh, et al., Cognitive and affective reassurance and patient outcomes in primary care: a systematic review, *Pain* 154 (2013) 2407–2416.
- [14] F. Derksen, J. Bensing, A. Lagro-Janssen, Effectiveness of empathy in general practice: a systematic review, *Br. J. Gen. Pract.* 63 (2013) e76–e84.
- [15] Z. Kelm, J. Womer, J.K. Walter, C. Feudtner, Interventions to cultivate physician empathy: a systematic review, *BMC Med. Educ.* 14 (2014) 219.
- [16] D.L. Roter, R.M. Frankel, J.A. Hall, D. Sluyter, The expression of emotion through nonverbal behavior in medical visits: mechanisms and outcomes, *J. Gen. Intern. Med.* 21 (Suppl. 1) (2006) S28–S34.
- [17] S.G. Henry, A. Fuhrel-Forbis, M.A. Rogers, S. Eggly, Association between nonverbal communication during clinical interactions and outcomes: a systematic review and meta-analysis, *Patient Educ. Couns.* 86 (2012) 297–315.
- [18] M. Hojat, D.Z. Louis, V. Maio, J.S. Gonnella, Empathy and health care quality, *Am. J. Med. Qual.* 28 (2013) 6–7.
- [19] G.C. Kane, J.L. Gotto, S. Mangione, S. West, Hojat M. Jefferson, Scale of patient's perceptions of physician empathy: preliminary psychometric data, *Croat. Med. J.* 48 (2007) 81–86.

- [20] J.K. Freburger, L.F. Callahan, S.S. Currey, L.A. Anderson, Use of the Trust in Physician Scale in patients with rheumatic disease: psychometric properties and correlates of trust in the rheumatologist, *Arthritis Rheum.* 49 (2003) 51–58.
- [21] P.A. Harris, R. Taylor, R. Thielke, J. Payne, N. Gonzalez, J.G. Conde, Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support, *J. Biomed. Inform.* 42 (2009) 377–381.
- [22] D.C. Seaberg, S.A. Godwin, S.J. Perry, Teaching patient empathy: the ED visit program, *Acad. Emerg. Med.* 7 (2000) 1433–1436.
- [23] F. Derksen, J. Bensing, A. Lagro-Janssen, Effectiveness of empathy in general practice: a systematic review, *Br. J. Gen. Pract.* 63 (2013) e76–84.
- [24] E.R. Melnick, E.G. O'Brien, O. Kovalerchik, W. Fleischman, A.K. Venkatesh, R.A. Taylor, The association between physician empathy and variation in imaging use, *Acad. Emerg. Med.* 23 (2016) 895–904.
- [25] D.D. Smith, J. Kellar, E.L. Walters, E.T. Reibling, T. Phan, S.M. Green, Does emergency physician empathy reduce thoughts of litigation? A randomised trial, *Emerg. Med. J.* 33 (2016) 548–552.
- [26] C.S. Lin, M.Y. Hsu, C.F. Chong, Differences between emergency patients and their doctors in the perception of physician empathy: implications for medical education, *Educ. Health (Abingdon)* 21 (2008) 144.
- [27] T. Pincus, N. Holt, S. Vogel, M. Underwood, R. Savage, D.A. Walsh, et al., Cognitive and affective reassurance and patient outcomes in primary care: a systematic review, *Pain* 154 (2013) 2407–2416.
- [28] K. Armstrong, K.L. Ravenell, S. McMurphy, M. Putt, Racial/ethnic differences in physician distrust in the United States, *Am. J. Public Health* 97 (2007) 1283–1289.
- [29] G.C. Alexander, L.P. Casalino, D.O. Meltzer, Patient-physician communication about out-of-pocket costs, *J. Am. Med. Assoc.* 290 (2003) 953–958.
- [30] M. Danis, R. Sommers, J. Logan, B. Weidmer, S. Chen, S. Goold, et al., Exploring public attitudes towards approaches to discussing costs in the clinical encounter, *J. Gen. Intern. Med.* 29 (2014) 223–229.
- [31] J.T. Hardee, F.W. Platt, I.K. Kasper, Discussing health care costs with patients: an opportunity for empathic communication, *J. Gen. Intern. Med.* 20 (2005) 666–669.