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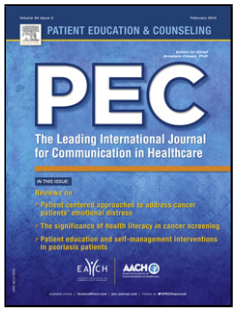

Patient affect, physician liking for the patient, physician behavior, and patient reported outcomes: A modeling approach

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Patient affect, physician liking for the patient, physician behavior, and patient reported outcomes: A modeling approach

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Highlights

- Patient negative affect is associated with physician liking
- Female and male physicians react differently to patient negative affect
- Physician behavior seem to influence patient reported outcomes more in first time visits

Abstract (198 words)

*Objective***:** To determine associations between patient affect and physician liking of the patient, and their associations with physician behavior and patient-reported outcomes.

Methods: Structural equation modeling based on coding of 497 videotaped hospital encounters, with questionnaires assessing pre-visit patient affect, post-visit patient affect and encounter evaluations, and physician liking of the patient, involving 71 physicians.

Results: In first visits, patient reported outcomes were strongly correlated with physician behavior and less so with physician liking, while in later visits, patient reported outcomes were directly related to physician liking and not mediated by physician behavior. Physician liking predicted physician behavior, more for female physicians in first visits. Patient negative affect before the visit was negatively associated with male physicians' liking. When acquainted, both patient positive and negative affect were associated with physician liking.

Conclusion: Physician liking of the patient plays a dynamic role in a consultation, is influenced by patient pre-encounter affect, and influences physician behavior. The dynamics are different in first and later visits, and influenced by physician gender.

Practice implications: Physicians should be aware how patient affect influences their behavior, and administrators should take any prior relationship between patient and physician into account when evaluating patient reported outcomes.

Key words:

communication, physician-patient relationship, patient-centeredness, patient-reported outcomes, affect, physician behavior, physician liking, structural equation modeling, Norway

1. Introduction

Interactions between healthcare providers and their patients have been abundantly studied, from many perspectives [1-5], including antecedents, processes, clinical and psychological outcomes, and the training of healthcare providers. The flourishing of the "patient-centered" approach to patient care has enriched the field by adding recognition of the crucial part played by social, psychological, and relationship factors in the process of medical care [6,7]. The present study furthers our understanding of the relational dynamics of medical encounters by taking a multivariable approach and creating statistical models to account for how those variables are related to each other.

In a large sample of hospital-based medical encounters, we administered surveys to the patient before and after the encounter to measure their affect, and after the visit to gather their evaluations of the experience (patient reported outcomes). We also coded (from video) the physician's behavior using a standard instrument to capture elements of patient-centered behavior. By this we refer to communication that brings the patient's perspective into the encounter, showing empathy, and working towards a shared understanding.

An important additional feature of the study was to inquire how the physician felt about the patient personally. In the large literature on physician-patient interaction, there are few studies that sought to understand this aspect of relationship. In our study we asked the physician the simple question of how much they liked the patient. Physician liking of the patient captures the personal emotional bondedness felt by the physician. Physician liking for the patient has proved to be a meaningful variable in several previous studies. The degree of liking, or disliking, between physician and patient was significantly mutual (reciprocal) in the one study

that examined this question, and furthermore both physician and patient significantly recognized how much the other liked them. Patients who were liked more by their physician were less likely to have considered changing physicians when asked a year later [8].

Four studies have shown that patients whose physicians like them more are more satisfied with their care [8-11]. Also, female physicians report liking their patients more than male physicians report, and more liking of the patient is associated with positive affect in both patient and physician [8,11]. Altogether, these findings suggest that liking may, consciously or unconsciously, underlie practice differences and influence patient outcomes through a cascade of mutual attributions and reciprocal responses.

Research on how much the physician likes the patient has not yet developed a fuller understanding of how liking fits into the bigger picture involving emotions (affect), physician behavior, and patient responses to physicians (satisfaction and other evaluations). The present study used structural equations to suggest possible causal paths among these variables. Novel features of the present study include independent measurement of physician behavior, the gathering of affect data both before and after the encounter, and the investigation of how physician gender and prior acquaintance between the parties might moderate the associations. Therefore, our main purpose was to explore how liking, affect, behavior, and patient evaluations relate to each other and to describe best-fitting models.

Using structural equation modeling requires *a priori* specific and plausible hypotheses (figure 1):

1. Patient-reported generalized negative/positive affect before the encounter is associated with physician liking [8]. In other words, physicians like the patient more when the patient feels, and presumably expresses, more positive affect at the outset. Here, the assumption is that in a new-patient encounter, as in any first-time interaction, the

parties develop a sense of their liking for the other very quickly and this is why we place liking early in the process. In acquainted dyads, the physician is likely to enter the visit with an already-formed degree of liking for the patient, which again suggests that liking could have an early causal impact on subsequent behavior and outcomes.

2. Patient-reported negative/positive affect before the encounter is associated with patient negative/positive affect after the encounter (i.e., patients' pre-encounter mood persists even after the encounter).
3. Physician liking is associated with physician patient-centered behavior. Physicians who like their patient more will behave in a more patient-centered manner.
4. Physician liking and physician patient-centered behavior are positively associated with favorable patient-reported outcomes and more positive (less negative) patient-reported affect after the encounter.

We analyzed observer-reported, physician-reported, and patient-reported data from 497 videotaped physician-patient encounters that took place in 2007-2008 in Akershus University Hospital, Norway. The data were collected in a randomized controlled trial where the aim was to assess the effect of communication skills training [12]. Some results of this data collection have been reported in other articles [13-15], but none contained the results in the present article.

2. Methods

2.1 Participants

All hospital physicians <60 years of age were eligible for the original study, and were randomly invited to participate based on a list stratified by department and position of doctor (consultant or resident). Of 103 physicians asked, 71 (69%) agreed to participate, and of these 30 (42%) were females. Age mean was 40.3 (SD 8.6). Participating physicians did not differ

from those who declined regarding age, gender, specialty, or position [14]. Patients were recruited consecutively as convenient; 519 (94%) of 553 approached agreed to participate [16]; 22 of the encounters with these patients turned out not to be analyzable mainly for technical reasons [17].

The mean number of encounters per physician was seven; in 187 (38%) the physicians were female. Of the patients, 256 (52%) were female and the age mean was 46.3 years (SD 24.6). 375 (75%) of the encounters were outpatient visits, 81 (16%) were with inpatients on ward rounds, and 41 (8%) were emergency room visits.

The patients reported prior acquaintance with the physician in 177 (36%) of the encounters. This relatively low percentage of prior acquaintance is the rule in Norwegian secondary care, because the hospital department clerks allocate encounters (rather than patients) to physicians (patients rarely choose themselves). Table 1 shows the distribution of prior acquaintance on patient and physician gender and department. Of the 71 physicians, 59 (83%) met both acquainted and unacquainted patients. Seven physicians met only unacquainted patients, five physicians had seen all their patients before. There was no gender difference related to distribution on first and later visits.

2.2 Measures

Encounter characteristics: Length of encounter was recorded from the video. Whether the physician had participated in the RCT was recorded, as this was associated with physician behavior in this material [12]. Type of visit (outpatient, emergency room, inpatient rounds) was recorded as we previously found a relationship between type of visit, physician gender, and patient satisfaction [15].

2.2.1 Physician reports

Physician liking. After the encounter, the physician responded to one statement about liking of the patient: "All in all, I liked this patient a lot." Responses were on a 5-point Likert scale (completely disagree – completely agree) [11].

2.2.2 Patient reports

Patient-reported affect. Patients reported their affective state before and after the encounter with a validated instrument, the Positive and Negative Affect Scale (PANAS) [14,18], with 25 items (12 positive: interested, strong, inspired, attentive, enthusiastic, proud, alert, excited, active, determined, happy, safe; 13 negative: distressed, jittery, upset, nervous, scared, hostile, irritable, ashamed, afraid, guilty, dull, angry, sad). This 5-point scale (very slightly or not at all, a little, moderately, quite a bit, very much/extremely) has been used in several clinical studies [19-21]. Positive and negative affect sum scores were calculated.

Patient satisfaction. Patient satisfaction was assessed by the global item "Using any number from 0 to 10, where 0 is the worst possible consultation with a doctor and 10 is the best possible consultation with a doctor, what number would you use to rate this consultation?", taken from The Consumer Assessment of Health Care Providers and Systems [22].

Physicians' behavior. Patients assessed the physician's behavior using the Four Habits Patient Questionnaire (4HPQ), with 15 4-point items (definitely no, somewhat no, somewhat yes, definitely yes) that were amalgamated to one score for each habit [17,23].

Physicians' communication and information. Patients completed six communication and information items from the Outpatient Experiences Questionnaire [24] (5-point all-anchored scales; Was the physician well prepared for the encounter, Did the physician talk to you in a way that you could understand, Did you trust the physician's medical competence, Did you feel that the physician cared for you, Were you able to tell the physician what was important

for you, Was it clear to you what you would have to do yourself after the encounter). This is the Norwegian nationwide assessment system for health care.

2.2.3 Observer ratings

Physicians' behavior. Trained psychology students rated all encounters using the Four Habits Coding Scheme (4HCS) based on watching the video [25]. Inter-rater reliability was acceptable [26].The 4HCS is a measure designed to describe patient-centeredness, consisting of 23 items describing physician actions that are rated on a five point scale (not effective – highly effective). Construct validity of the 4HCS is reported elsewhere [12,25,27,28]. Items were summated to provide one score for each habit.

2.3 Analyses

Description of modeling. The parameters were estimated using the lavaan package [29] in R [30]. To make regression coefficients comparable all variables were normalized prior to fitting the model. The physicians observed (4HCS) and patient reported (4HPQ) behavior were modeled as latent variables, with the summed score on the four habit subscales as the observed variables. Higher 4HCS and 4HPQ denote more observed and patient reported patient-centeredness, respectively.

To investigate any potential gender differences the model was first fitted for male and female physicians separately and differences in the effects were tested. Subsequently the model was refitted but with some parameters constrained to be equal for both males and females. The results of the hypothesis tests for the gender differences and the magnitude and direction of the estimates were used as a guide for which constraints were added. The overall model fit was assessed with Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI), and model comparison was done with Akaike's Information Criterion (AIC). A full covariance matrix is available as an appendix.

2.4 Ethical approval

This study was approved by the Regional Ethics Committee of South-East Norway (1.2007.356).

3 Results

Bivariate analyses. Variable characteristics are shown in Table 2. Physician liking, patient-reported outcomes, and patient positive affect after the encounter were significantly higher when there was prior acquaintance.

Physician liking was not associated with length of the encounter, type of encounter (outpatient, inpatient, ER), patient gender or age, or intervention status of the physician. Female physicians liked their patients significantly more than male physicians did (p=.005), this difference was highly significant for acquainted patients (p=.003) and not significant for unacquainted patients (p=.251).

Fitting the model. In the hypothesized model, prior acquaintance was included as an exogenous moderator. However, as acquaintance demonstrated profound effects on the models, we decided to fit models separately for encounters with and without prior acquaintance. Further, there were some striking differences between male and female physicians, but most of the associations were not significantly different between these groups. Hence, we fitted constrained models to calculate common estimates for female and male physicians when they were not significantly different.

3.1 No prior acquaintance

When there was *no* prior acquaintance, we found a good model fit (Figure 2a). There were strong associations between observed physician behavior and patient-reported outcomes. For female physicians, there was a significantly stronger association between physician liking and

observed physician behavior than for male physicians; in other words, female physicians' patient-centered behavior appeared to be more influenced by their personal liking of the patient than was the case for male physicians. On the other hand, patient-reported negative affect before the encounter was not associated with female physicians' liking, but was a negative predictor of male physicians' liking; presumably, the patient's mood as expressed directly or indirectly appears to have had an effect on how much the male physician liked them. Notably, liking was not a significant predictor of patient-reported outcomes (with one exception of limited effect) although it was, for female physicians, a predictor of their patient-centered behavior.

3.2 Prior acquaintance

When there *was* prior acquaintance, model fit was satisfactory (Figure 2b). As in the not-acquainted visits, patients' pre-visit negative affect predicted physicians' liking significantly more for male than female physicians. Also, as in the not-acquainted visits, physicians' liking predicted their patient-centered behavior more for female than male physicians although this latter gender difference was not significant. In contrast to first visits, how much the physician liked the patient demonstrated strong direct associations with patient reported outcomes, not mediated by physician patient-centered behavior. Also, when there was prior acquaintance, patient positive affect seemed to play a positive role in physician liking, significantly, but not strongly.

In sum, when patients and physicians are acquainted, liking is strongly associated with patient reported outcomes, while physician behavior is not, even if liking is associated with behavior. Both patient positive and negative affect are associated with liking.

4. Discussion and conclusion

4.1 Discussion

These findings confirm that physicians' liking of their individual patients has a dynamic role in the processes of care. The findings also suggest that there are important differences between encounters with unacquainted and acquainted dyads, respectively. Furthermore, we demonstrated that patient negative affect before the visit plays a role in medical encounters, but one that is seemingly different for female and male physicians. The structural equation modeling made it possible to determine the mediating roles of physician liking and behavior on patient reported outcomes.

4.1.1 Prior acquaintance as a moderator

The bivariate analyses showed that patient positive affect before the visit, physician liking, and patient evaluations were all significantly higher in acquainted than in non-acquainted encounters. One gets the picture that an established relationship between patient and physician creates a favorable atmosphere, which seems to make physician behavior less important for patient evaluations. This fits with the original validation study of the Four Habits Coding Scheme, where there was no correlation with patient reported outcomes: all encounters in that study were with acquainted patients and physicians [25]. Our findings confirm that any prior relationship has important impact on a medical encounter, maybe mostly through an affective connection. Studies in primary care have established a correlation between a continuous relationship and patient satisfaction [31,32], and a small, but significant correlation has been found between number of prior visits with a physician and patient satisfaction in outpatient clinics [33]. Such studies have however not included video coded behavior. We have not found earlier studies that have demonstrated how a previous relationship influences affective mechanisms, physician behavior in the consultation, and subsequently specific patient reported outcomes other than satisfaction.

4.1.2 Physician gender as a moderator

Findings that differ according to provider gender are important because providers should be aware of any (inadvertent) tendencies their gender may introduce in their work performance. The overall score on the liking item was significantly higher for female than for male physicians. This result is consistent with the finding in two previous studies of physicians' liking for their patients [8, 11], both of which were based on acquainted physician-patient dyads. Further research is needed to confirm that this gender difference does not appear in first visits. If it does, it could indicate that female physicians are more successful in forming relationship bonds over time with their patients than male physicians are, which could have important implications for practice style and outcomes.

We found significant differences regarding the influence of patient-reported negative affect before the encounter on male and female physicians' liking of the patient. Patient negative affect reduced male physicians' liking significantly, while it appeared not to influence female physicians' liking, in both the acquainted and not-acquainted visits. We do not know why this is so. A speculative explanation could be that female physicians are less willing than male physicians to admit that they do not like some patients, another that female physicians suspend liking in favor of trying to understand, work with, resolve, or see past negative emotion, which would be consistent with the literature on gender differences in empathy, where the definition of empathy includes trying to take the other person's perspective [34, 35]: thus they may work harder to understand the source of the patient's affect and to make allowances, which would in turn influence their own emotional reactions to the patient. However, although the patients' affect did not influence female physicians' liking of the patient, their liking did predict their patient-centered behavior more than was the case for male physicians, significantly so for not-acquainted visits and with the same pattern, but not significant, in acquainted visits. Notably, 83% of the physicians were involved in both first

and later visits, and there was no gender difference in proportion of first visits, so the pattern cannot be explained by which physicians met acquainted and unacquainted patients.

4.1.3 Strengths and limitations

The present study extended research on physicians' liking for their patients by including observed behavior of the physicians and a more in-depth analysis of patients' affect than has been possible in previous studies. We also employed a modeling approach that included physician gender and degree of acquaintance as moderators, enabling a rich set of new inferences to be drawn and hypotheses proposed for further research.

One limitation is that we do not have clinical data, so we could not check how the patient's health status influenced the findings. It is established that physicians like their sicker patients less than their more healthy ones [8,10,11], and being more sick is likely to be associated with negative affect. Another limitation is that many encounters have caregivers or assistant health personnel present. We decided to explore how this influences outcomes in a separate study, in order to restrict the number of variables in the models.

Using structural equation modeling, it is necessary to make theory-based up-front hypotheses that limit the possibilities for fitting different models. We have described the *a priori* model and the steps of our analysis carefully to account for this. Of note, we did not attempt to increase model fit by adding paths that were not thought of beforehand. Instead, we removed variables that did not influence the variables downstream in the model, and did group analyses where the model fit indicated so, only if it made theoretical sense.

4.2 Conclusion

We found that all our *a priori* hypotheses were true, but not always for both genders and dependent on prior acquaintance. Prior acquaintance has an important impact on physician

liking and patient reported outcomes. Patient affect is associated with physician liking and behavior, differently for male and female physicians, whereas female physicians' liking influences their behavior more than male physicians' liking does. However as expected, pre-visit mood is persistent, and physician liking and behavior have limited influence on patient affect after the visit.

4.3 Practice implications

The findings have implications for how patient reported outcome measures can be used for evaluations of physicians. We have employed three different measures, one general satisfaction measure, one focused on communication and information, and one designed to describe the elements in the Four Habits approach to effective clinical communication. They are correlated, and the two latter carry elements that are considered patient-centered behavior. A physician who is not very patient-centered and mainly meets chronic patients who know him/her may not receive feedback or incentives to change behavior because in such a practice long-standing relationships might counteract or diminish the association between behavior and patient reported outcomes.

In training how to handle the emotional concerns of patients, trainees should be encouraged to reflect on how patients' emotional behavior may influence their own emotions.

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Figure legends

Figure 1. Hypothesized model for association between patient affect, prior acquaintance, and physician liking, physician behavior, and patient reported outcomes.

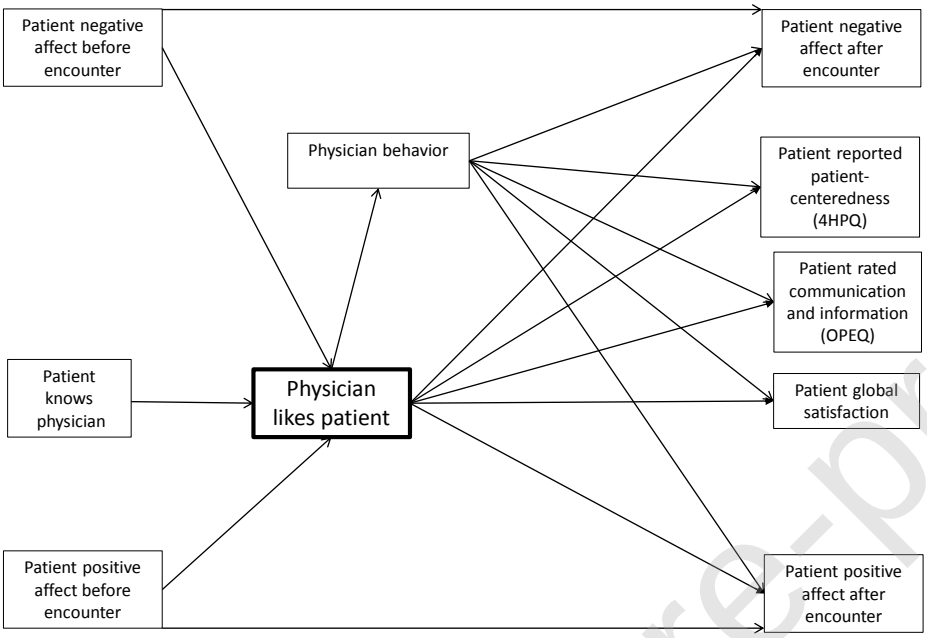
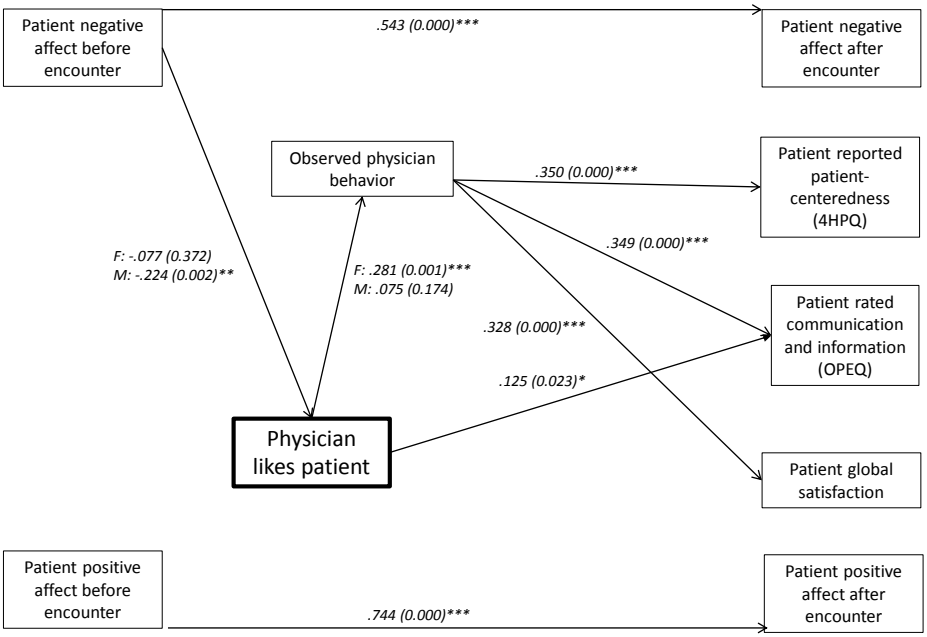


Figure 2. Final best fitted model for encounters where there a) was not prior acquaintance (Tucker-Lewis Index = .930, Comparative Fit Index = .934), and b) was prior acquaintance (Tucker-Lewis Index = .889, Comparative Fit Index = .894). Standardized regression coefficients for female physicians (F) and male physicians (M). Where gender is not indicated, the coefficients were not significantly different. Dotted arrows indicate that there were significantly different, opposite gender coefficients. Missing arrows indicate no significant coefficients. *=p<.05, **=p<.01, ***=p<.001.



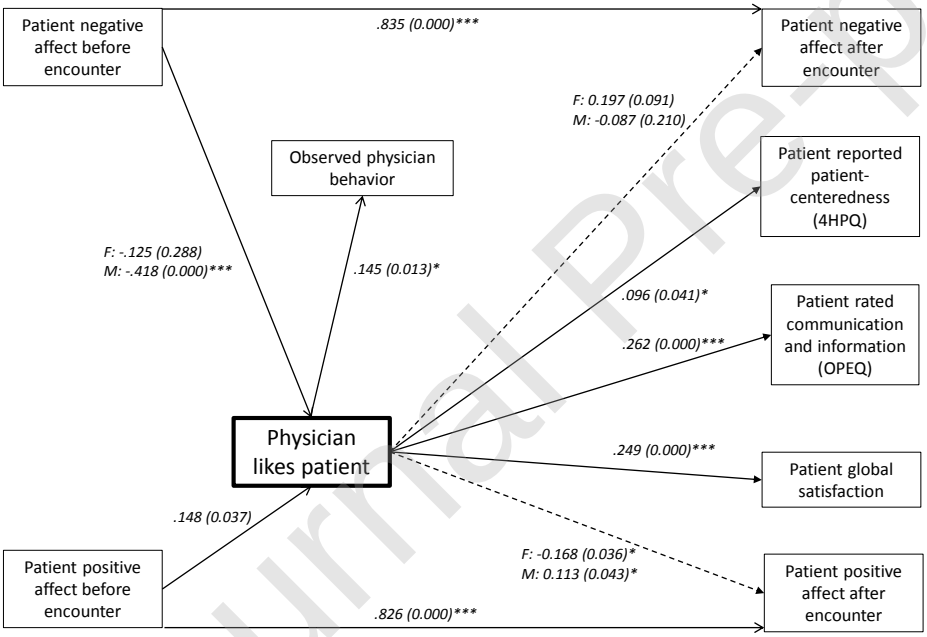


Table 1

The distribution of 497 encounters according to prior acquaintance between physician and patient. Departments sorted in order of percentage of prior acquaintance.

		No acquaintance	Acquaintance

		(N=320)	(N=177)
Patient gender			
	Female	164 (64%)	92 (36%)
	Male	156 (65%)	85 (35%)
Physician gender			
	Female	119 (64%)	68 (36%)
	Male	201 (65%)	109 (35%)
Department of physician			
	Hematology	3 (30%)	7 (70%)
	Endocrinology	6 (38%)	10 (63%)
	Nephrology	12 (38%)	20 (63%)
	Infectious diseases	8 (42%)	11 (58%)
	Anesthesiology/intensive care	6 (43%)	8 (57%)
	Gastrosurgery	17 (53%)	15 (47%)
	Pediatrics	37 (58%)	27 (42%)
	Gastroenterology	5 (63%)	3 (38%)
	Vascular surgery	5 (63%)	3 (38%)
	Cardiology	33 (67%)	16 (33%)
	Pulmonology	26 (68%)	12 (32%)
	Otorhinolaryngology	17 (71%)	7 (29%)
	Orthopedics	34 (74%)	12 (26%)
	Urology	17 (74%)	6 (26%)
	Gynecology	37 (77%)	11 (23%)
	Neurology	49 (85%)	9 (16%)
	General internal medicine	8 (100%)	0 (0%)

Table 2.

Characteristics of standardized variables (range 0-100) and duration, with and without prior acquaintance. N=497 unless otherwise specified.

	No acquaintance (N=320)		Acquaintance (N=177)	
	Mean	SD	Mean	SD
Duration of encounter*	22 m 37 s	14 m 35 s	19 m 17 s	10 m 18 s
Patient reported affect (PANAS)				
Positive before encounter	52.51	17.10	56.39	16.75
Positive after encounter*	53.82	18.51	59.23	19.59
Negative before encounter	15.50	13.93	12.42	14.02
Negative after encounter	9.87	12.12	9.03	14.34
Physician liking of patient*	69.53	15.75	75.14	16.54
Observed physician behavior (4HCS)	39.54	15.93	41.75	15.23
Patient reported outcomes				
Patient satisfaction (CAHPS)*	86.09	13.44	90.23	12.27
Physician behavior (4HPQ)*	84.73	13.25	91.30	10.16
Communication and information (OPEQ)*	78.45	17.07	85.40	17.32

* $p < .01$ between no acquaintance and acquaintance.