Relationship of Interpersonal Behaviors and Health-Related Control Appraisals to Patient Satisfaction and Compliance in a University Health Center

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Abstract. Objective: The authors’ aim was to evaluate patient-provider relationships in a college health center. Participants: Eighty student patients and their health-care providers. Methods: Patients completed a measure of perceived health competence before a consultation and measures of provider participatory behavior and interpersonal behavior before and after the consultation. They evaluated their satisfaction with care and compliance after the consultation and again 2 weeks later. Providers completed measures of their participatory behavior and patients’ interpersonal behavior after the consultation. Results: Patients preferred to be well informed and to have their preferences taken into account, and generally felt competent at managing their own health affairs. They indicated they obtained the high level of participation they desired. Patients desired and actually experienced friendly and submissive providers. Degree of match between patients’ desired and actual level of involvement in their care was associated with greater satisfaction. A greater match between the extent to which they desired the provider to be affiliative and the provider’s actual affiliative behavior was associated with more satisfaction. No variables were predictive of patient compliance. Conclusion: The authors discuss results in terms of the influence of situational factors characteristic of a college health center.

Keywords: community health, counseling

Physician-patient communication can have a strong impact on a patient’s response to treatment. Good communication and informed decision making likely promote better health and are regarded as intrinsic components of good quality care. Research in this area has accelerated in recent years, with much of the impetus coming from the growing emphasis in medicine on finding ways to implement the “shared decision-making” and “patient-centered” models of health care. These models, in contrast to the traditional paternalistic model of patient care, center around patients’ needs to be fully informed and actively participate in decision making regarding their own health care. However, the salutary effects of giving patients more responsibility have not been definitively established, and there is increasing recognition that more responsibility may not be suitable for all patients. Patients differ in the degree to which they desire information and can share responsibility for decision making, and it has been argued that doctors should tailor involvement to patients’ desired level of control rather than aim for overall increased patient participation.

The patient-centered model particularly emphasizes affective care, or the need for physicians to engage in high quality interpersonal relationships with patients. In general, experts have found that high-quality doctor-patient relationships (defined largely on the basis of physician behaviors) are associated with a range of positive outcomes, including increased patient trust, compliance with medical advice, satisfaction with care, reduced emotional distress, and improved biological disease status. Because researchers have focused primarily on behavioral codings of physician behavior and secondarily on codings of patient behavior, they seldom address how these behaviors are interpreted by the other party. The findings from available research indicate little agreement between patients’ and physicians’ perceptions of the physician-patient relationship, and few investigators have attempted to measure the relationship in a way that incorporates both the patients’ and the physicians’ perceptions of their counterparts.

In the present study, we evaluated both patients’ (college students) and health-care providers’ perceptions of the extent to which the provider presented information and involved the patient in decision making during a routine visit to a college health center. We also evaluated the students’
desired levels of participation prior to the consultation to provide a measure of the difference between their desired and actual degrees of participation. We evaluated the interpersonal relationship established between physician and patient during the consultation by having physicians and patients respond to the Impact Message Inventory (IMI)\(^{21,22}\) just after the completion of consultation. This instrument provides measures of interpersonal control (to dominate, take charge of) and affiliation (to be friendly and caring toward), which have been established as the 2 major dimensions of interpersonal behavior.\(^{23-24}\) It also provides an integrated measure of the degree of fit (or complementarity) between 2 interactants’ control and affiliation behaviors. According to interpersonal theory, complementarity occurs when there is correspondence in affiliation behaviors (eg, affiliation evokes affiliation, hostility evokes hostility) and reciprocity in control behaviors (eg, dominance evokes submission, and vice versa). We examined both sets of variables (patient involvement in their care and physician-patient interpersonal relationship) in relation to patients’ satisfaction with their care assessed immediately after the consultation and at a 2-week follow-up period. We also assessed patients’ compliance with providers’ medical recommendations at the 2-week follow-up.

On the basis of prior findings,\(^8\) we expected that patients who viewed themselves as having received more information and having been more involved in decision making would be more satisfied with their care. Because researchers\(^9\) have found that some patients would rather not take on responsibility and are more comfortable with a more traditional paternalistic approach, we expected that patients whose actual level of involvement matched their desired level of involvement would have the highest levels of satisfaction. Given prior interpersonal studies in which investigators\(^16\) used verbal and nonverbal ratings of physician interpersonal behavior, we expected patient satisfaction to be positively associated with physician affiliation and negatively associated with physician control.\(^16\) On the basis of interpersonal theory and some promising findings using the IMI,\(^16\) we expected patients to be most satisfied to the extent that a close-match complementary relationship was established with their physician.

**METHODS**

The Virginia Commonwealth University’s Institutional Review Board approved our study.

**Participants**

One-hundred and twenty students presenting with routine health problems at an urban university health center initially enrolled in the study. Health-care providers did not provide data for 27 of the participants. We could not reach 12 others for the 2-week follow-up and did not include 1 participant’s data because visual inspection indicated that the participant responded erratically to measures. Thus 80 patient participants completed the study and provided usable data. Their mean age was 21.09 years (standard deviation [SD] = 4.95), and the range was 18 to 50 years. The patients were predominantly women \((n = 69; 86.3\%)\) and Caucasian \((n = 52; 65.0\%)\) or African-American \((n = 19; 23.8\%)\). Symptom presentations varied from more benign complaints, such as allergies or cold-like symptoms, to more serious complaints, such as depression and tuberculosis. The modal reason for presenting was for cold/flu-like symptoms \((n = 16; 20.1\%)\), followed by annual OB/GYN exams \((n = 13; 16.3\%)\). Most of the 14 health-care providers were women \((n = 13; 92.86\%)\), and 7 were physicians \((50\%)\), 6 were nurse practitioners \((42.86\%)\), and 1 was a physician’s assistant \((7.14\%)\). Health-care providers charted their professional status for 51 of the 80 patient participants. (Physicians saw 26 patient participants, and nonphysicians—24 of whom were nurse practitioners—saw 25.) Because analyses identified no differences between the professional groups on any of the study measures, we did not differentiate among types of health-care providers in subsequent analyses.

**Measures**

**The Participatory Style of Physician Scale (PSPS)**

Kiesler and Auerbach\(^{25}\) designed the PSPS to measure a physician’s participatory style during consultations with patients. Before the consultation, we asked patients to evaluate the degree of participatory behavior they desired of the provider (PSPS Desired), whereas both patients (PSPS Actual) and providers (PSPS Provider) evaluated the provider’s actual participatory behavior immediately after the consultation. We constructed the 15-item measure to measure 3 subscales: Providing Medical Information (eg, discussed the benefits or risks of each of the treatment alternatives), Gathering Personal Information (eg, encouraged the patient to talk about personal concerns related to the treatment decision), and Facilitating Shared Decision Making (eg, provided the patient an equal role in the treatment decision process). These subscales represent essential components emphasized in the shared decision-making models of Charles et al.,\(^26\) as well as important elements found in models of informed consent in the bioethics literature.\(^27\)

**IMI**

The IMI\(^{21,22}\) allows researchers to characterize a target individual’s interpersonal behavior through assessment of the IMI respondent’s reactions evoked during encounters with the target. Examples of items are: When I was with this person, he/she made me feel ... “bossed around,” “appreciated by him/her,” “distant from him/her,” “that I could tell him/her anything and he/she would agree,” “that he/she wants me to put him/her on a pedestal.” We used a 20-item short form of the 56-item IMI octant version (IMI-C\(^{28}\)). The practitioner completed a first version on the patient at the end of the consultation (IMI-Patient). A second, preconsultation version asked patients to respond in terms of how they would like to feel when they are with the practitioner (IMI-Desired). A third, postconsultation version asked patients to rate the practitioner’s actual
behavior during the consultation (IMI-Actual). The IMI-C short form produces 4 scale scores: dominant, hostile, submissive, and friendly; and 2 axis scores: control (dominant minus submissive) and affiliation (friendly minus hostile). Because pairs of IMI protocols were available for interacting patient-provider dyads, we also obtained 3 interpersonal complementarity indexes: for the control and affiliation dimensions separately, as well as for their interactive combination. 29 In highly complementary transactions, person A’s dominance is responded to with person B’s submission (and vice versa), and person A’s friendliness is responded to with person B’s friendliness or A’s hostility is responded to with B’s hostility. Reliability and validity evidence for the full IMI is ample 21,30,31; reliability and validity for IMI short forms, presented by Kiesler and Auerbach, 30 is comparable to that for the full version.

Perceived Health Competence Scale (PHCS) 32

The PHCS is an 8-item scale that helps investigators measure the degree to which an individual feels capable of effectively managing health outcomes. The PHCS has shown excellent internal consistency reliability ($\alpha = .90$) and excellent stability for almost 3 years. Smith et al 32 present construct validity data.

Patient Satisfaction With Care Questionnaire

We constructed a 10-item questionnaire that included the overall satisfaction question from the RAND 55-item instrument 24 and questions on 2 visit-specific domains: provider technical competence and physician sensitivity. We included this face valid scale because we could not find a brief, valid measure of patient satisfaction in an outpatient student-health-center-type setting in the literature, and longer measures were deemed unsuitable for the present study. We obtained an alpha reliability of .826 on our subjects.

Patient Compliance Measure

We used a single-item face valid measure in which subjects were asked how well they rated their overall level of compliance on a 5-point Likert scale (1 = poor, 5 = excellent). This assessment was consistent with those found in previous literature on patient compliance. 34 We also tried to assess the extent to which patients complied with each recommendation made by the provider; however, these data could not be analyzed because of the large variability in the nature of recommendations made to individuals.

Procedures

In the health center waiting room, a graduate assistant introduced himself in the following way: “Hello, my name is XX, and I’m a graduate student in the Department of Psychology. We are conducting a study examining patient satisfaction and compliance with treatment, and I would appreciate it if you would consider enrolling. The study consists of your answering a few questions before and after your visit, and then allowing us to contact you by telephone in approximately 2 weeks to ask 2 more brief questions about the care you received. Everyone who enrolls will be entered into a drawing for a gift certificate. Would you be interested in enrolling?” The assistant told the patients that no member of the Student Health Center staff would see their responses and that a decision not to enroll would in no way affect their care at the clinic. When patients agreed to enroll, they then read and signed the consent form and completed a demographic information form, the IMI, PSPS, and the PHC before seeing the provider. Following the consultation, the provider completed the PSPS, the Provider Information Measure, and the IMI. The patients returned to the waiting room and again completed the IMI and PSPS, as well as the Patient Information Measure and the Patient Satisfaction With Care Questionnaire. About 2 weeks later, the graduate assistant recontacted the patients via phone and asked them to verbally respond to the patient compliance measure and for the second time to the Patient Satisfaction With Care Questionnaire.

RESULTS

We present descriptive data first on the measures of provider and patient appraisals of physician participatory behavior, their interpersonal appraisals of each other, and patients’ perceived health competence. This is followed by analyses of relationships between these measures and the outcome assessments of patient satisfaction and compliance.

Descriptive Analyses

Physician Participatory Behavior

Kiesler and Auerbach 25 designed the PSPS to measure 3 areas of provider participatory behavior with patients: provision of medical information, opportunities for shared decision making, and solicitation of patient personal information. Patients completed the measure both before (PSPS-Desired) and after (PSPS-Actual) the visit; after the visit, the providers described their actual participatory behavior during the visits (PSPS-Provider). An exploratory factor analysis, conducted on the PSPS-Desired indicated, however, that all items loaded substantially on a single factor that accounted for 60.67% of the common variance (eigenvalue of 9.1). As a result, separate subscale analyses were not justified; instead, we used a single mean score based on all 15 items in all subsequent analyses. We found a Cronbach’s alpha of .94 for the total scale, indicating high internal consistency.

Mean item scores for the 3 PSPS versions were higher than 4 (on a 5-point scale), indicating that patients desired and received a high level of participatory support from the provider and that the providers felt they helped patients participate to a high degree during the consultation. We compared patients’ PSPS-Desired scores with their PSPS-Actual scores to determine the degree of match they attained during their visit. After conducting a t test, we found no significant difference between the means, indicating that the patients perceived their actual levels of participation ($M = 4.46, SD = .69$) to match closely their desired level, $M = 4.57, SD = .64, t(79) = 1.64, p > .10$. There
was also no significant difference between the participants’ views of patient involvement; providers’ perceptions \((M = 4.43, SD = .62)\) matched closely patients’ perceptions, \(M = 4.46, SD = .69, t(79) < 1\). Correlational findings supported a high degree of match between patients’ desired and actual participatory levels, \(r(79) = .613, p < .001\), and a low to moderate agreement between provider and patient perceptions of patients’ actual levels of participation, \(r(79) = .281, p < .05\).

**Interpersonal Appraisals**

We obtained the IMI-C from the patient before (IMI-Desired) and after (IMI-Actual) the visit, and from the provider (who rated the patient) after the visit (IMI-Patient). Results from a repeated measures analysis of variance (ANOVA) of the 4 IMI-Desired scores indicated that differences among the 4 scales were highly significant, \(F(3, 237) = 308.63, p < .001\). Post hoc contrasts indicated that patients’ desired friendliness scores (from providers) \((M = 2.85, SD = .61)\) were significantly higher than each of the other 3 (all \(p < .001\)); desired provider submissiveness \((M = 1.71, SD = .49)\) was higher than desired dominance \((M = 1.50, SD = .43, p = .001)\), and desired provider hostility \((M = 1.15, SD = .37)\) was significantly lower than the other 3 (all \(p < .001\)). Hence, patients wanted providers who were highly friendly, minimally hostile, and more submissive than dominant. We found a similar pattern for patients’ postvisit ratings (IMI-Actual) of providers’ actual interpersonal behaviors during the consultation, \(F(3, 237) = 296.54, p < .001\). Patients rated their physicians as having been more friendly \((M = 2.96, SD = .64)\) than hostile \((M = 1.12, SD = .26, p < .001)\) and more submissive \((M = 1.84, SD = .55)\) than dominant \((M = 1.33, SD = .34, p < .001)\). With regard to providers’ evaluations of the patients’ behaviors during the consultations (IMI-Patient), a repeated measures ANOVA revealed a significant difference among the 4 scales, \(F(3, 237) = 163.73, p < .001\). Providers similarly rated their patients as having been more friendly \((M = 2.74, SD = .59)\) than hostile \((M = 1.31, SD = .57, p < .001)\) and more submissive \((M = 2.12, SD = .62)\) than dominant \((M = 1.27, SD = .44, p < .001)\). In sum, patients and providers rated each other as enacting the identical pattern of interpersonal behavior during their visit, the same pattern also that patients desire more generally from any medical provider—namely, more friendliness than hostility and more submission than dominance.

We also calculated analyses on the 3 complementariness scores (affiliation, control, and total complementariness), which provide measures of the degree of interpersonal match during the consultations between provider and patient. The closer each complementarity score is to 0, the closer the match between provider and patient interpersonal behaviors. Results showed that the interpersonal interactions were more complementary with respect to affiliation \((M = .95, SD = .89)\) than to control \((M = 1.38, SD = .83, t(79) = 2.90, p = .005)\). Patients and providers thus mirrored each other’s friendly or hostile behaviors but did not match each other’s dominant or submissive behaviors with the opposite behaviors.

**Patients’ Perceived Health Competence**

The PHCS, administered to patients before their visit with the providers, assessed the degree to which the patients felt generally competent at managing their health outcomes. For our sample, patients expressed high competence at managing their own health outcomes \((M = 4.52\) on a 6-point item scale, \(SD = .88)\). Our sample contrasted markedly with Smith et al.’s\(^{35}\) normative sample of college students who showed a significantly lower mean item score of 3.99, \(SD = .72, t(264) = 5.10, p < .001\).

**Associations With Patient Outcomes of Satisfaction and Compliance**

Our 2 main outcome measures were patient satisfaction (as measured by the Patient Satisfaction with Care Questionnaire) and patient compliance with treatment recommendations (as measured by the Patient Compliance Measure). Table 1 shows Pearson intercorrelations between IMI and PSPS scores (predictors) and the outcome measures (satisfaction just after the visit and at the 2-week follow-up, and patient compliance at the 2-week follow-up).

Patients’ mean rating of overall compliance with providers’ recommendations was between good and very good \((M = 3.37, SD = .99)\). As can be seen in Table 1, patients’ reports of compliance with their providers’ medical recommendations showed no significant associations with any of the predictor variables. The following discussion, then, is restricted to the significant associations obtained with measures of patient satisfaction found in Table 1.

For the PSPS, we calculated the match of patients’ desired level of participation with their actual level of participation by subtracting PSPS-Desired (given prior to the consultation) from PSPS-Actual (given after the visit). On the IMI, we calculated match of a patient’s desired level of provider affiliation and control separately by subtracting IMI-Desired from IMI-Actual. For both the PSPS and the IMI, a resulting score of 0 indicates a perfect match; a negative correlation with satisfaction indicates that lower scores (indicating greater match) are associated with higher satisfaction.

A closer match between patients’ PSPS desired and actual levels of participation was associated with greater patient satisfaction with the consultation, both immediately after the visit, \(r(79) = -.537, p < .001\), and at the 2-week follow-up, \(r(79) = -.294, p = .008\). Greater match between patients’ desired (IMI-Desired) and actual (IMI-Actual) provider affiliation scores was significantly correlated with patient satisfaction immediately following the visit, \(r(79) = -.544, p < .001\), and at the 2-week follow-up, \(r(79) = -.387, p < .001\). Match between patient desired and actual physician control was only moderately correlated with satisfaction at the 2-week follow-up, \(r(79) = -.247, p < .05\), and uncorrelated with satisfaction immediately following the visit, \(r(79) = -.197\).

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For the IMI-C, higher patient ratings of provider affiliation (patients viewed their providers as more friendly than hostile) were associated with greater patient satisfaction both after the visit \( r(79) = .639, p < .001 \), and at the 2-week follow-up \( r(79) = .512, p < .001 \). On one hand, lower patient ratings of provider control (patients viewed their providers as more submissive than dominant) were associated with higher patient satisfaction at the 2-week follow-up \( r(79) = –.233, p = .037 \), but not immediately after the visit \( r(79) = –.172, p = .128 \). On the other hand, neither patient control or affiliation as perceived by providers was correlated with patient satisfaction scores either immediately after the visit or at 2-week follow-up, all \( r_{s}(79) < 10 \). And contrary to expectation, none of the 3 IMI complementarity scores (IMI-Actual compared with IMI-Patient) was significantly associated with patient satisfaction either immediately following the visit or at the 2-week follow-up.

As a follow-up to these correlational findings, we conducted exploratory hierarchical regression analyses to determine the relationship between satisfaction with treatment immediately after the visit and the following set of predictor variables: patient assessment of their actual participation level during the conference (PSPS-Actual), the match between the patient’s desired and actual level of participation during the conference (PSPS-Desired with PSPS-Actual), patient affiliation during the visit (IMI Actual-Affiliation), and match between patients’ desired level of provider interpersonal behavior and the provider’s actual behavior during the consultation as perceived by the patient (calculated separately for Control and Affiliation). The analyzed model posited that greater match between desired and actual provider participatory styles and the greater the match between desired and actual provider control and affiliation would lead to greater patient satisfaction with the encounter. To obtain the most parsimonious explanation for the variance in patient satisfaction scores, we entered actual participation levels and patient affiliation first and PSPS match and IMI match scores second. The test of the model was significant, \( F(2, 77) = 36.70, p < .001 \), and accounted for 48.8% of the variance in patient satisfaction scores immediately following the visit. Both patient affiliation scores and actual provider participatory

| TABLE 1. Pearson’s Correlations of IMI Subscales, PSPS Measures, and Match Variables With Patient Satisfaction After the Visit, at the 2-Week Follow-Up, and Patient Compliance |
|---------------------------------|-----------------|-----------------|
|                                | Satisfaction after visit | Satisfaction at 2-week follow-up | Patient compliance |
| IMI-Desired                    |                 |                              |                    |
| Dominance                      | .087            | .154                         | .184               |
| Submissiveness                 | .011            | .074                         | .009               |
| Friendliness                   | .133            | .195                         | .115               |
| Hostility                      | .147            | .151                         | .037               |
| IMI-Actual                     |                 |                              |                    |
| Dominance                      | –.049           | –.032                        | .078               |
| Submissiveness                 | .142            | .214                         | –.084              |
| Friendliness                   | .541**          | .452**                       | .050               |
| Hostility                      | –.562**         | –.406**                      | .147               |
| Affiliation                    | .639**          | .512**                       | –.008              |
| Control                        | –.172           | –.233*                       | .130               |
| IMI-Patient                    |                 |                              |                    |
| Dominance                      | –.003           | .025                         | –.099              |
| Submissiveness                 | .062            | .105                         | –.227              |
| Friendliness                   | .022            | .093                         | –.074              |
| Hostility                      | –.053           | .037                         | –.083              |
| Affiliation                    | .046            | .036                         | .002               |
| Control                        | –.064           | –.087                        | .162               |
| PSPS-Desired                   | .054            | –.083                        | .027               |
| PSPS-Actual                    | .516**          | –.286**                      | –.085              |
| PSPS provider                  | .012            | –.003                        | –.099              |
| PSPS match                     | –.537**         | –.294**                      | .075               |
| IMI affiliation match          | –.544**         | –.387**                      | –.072              |
| IMI control match              | –.197           | –.247*                       | –.006              |
| IMI complementarity            |                 |                              |                    |
| Affiliation                    | –.064           | –.219                        | .000               |
| Control                        | .156            | .217                         | –.207              |
| Total                          | .064            | –.013                        | –.148              |

IMI = Impact Message Inventory; PSPS = Participatory Style of Physician Scale.  
*p < .05. **p < .01.
scores as evaluated by patients were significant, $\beta = .515$, $p < .001$, and $\beta = .309$, $p = .001$ respectively.

To examine the extent to which the PSPS and the 2 IMI match scores (affiliation and control) accounted for the variance in patient satisfaction scores, we entered these 3 variables into the second step. Again, the overall model in step 2 was significant, $F(5, 74) = 20.43$, $p = .002$, and accounted for 58.0% of the variance in patient satisfaction scores immediately following the visit. The increase in explained variance was significant, $F(3, 74) = 5.38$, $p = .002$. Whereas PSPS match was a significant predictor, $\beta = -.311$, $p < .001$, IMI control and IMI affiliation match were not, $\beta = .097$, $p = .246$, and $\beta = .768$, $p = .445$ respectively. Patient affiliation and participatory provider scores continued to be significant predictors (see Table 2).

**COMMENT**

Our college student patients strongly desired to be well informed by their providers regarding their condition, diagnosis, and available treatments, and to have their preferences taken into account in the decision-making process. Although we are not aware of equivalent college health center data, our findings are consistent with research conducted in other medical settings showing that younger, more educated individuals and those dealing with relatively less serious medical situations are less willing to cede control to physicians and are more likely to want to be actively involved in their own care.10 Our student patients also felt competent at managing their own health outcomes, significantly more so than a college student sample evaluated in 1995.32 This sample difference may reflect a trend of rising perceived health competence among college students (and possibly the population as a whole) resulting from increased availability of medical information from the Internet.35

Patients at our college health center rated most health-care providers here as very willing to share information with them and to involve them in health-care decisions. This uniform willingness to involve patients contrasts with previous findings that physicians differ in their receptiveness to patients taking an active role36 and that, in day-to-day office practice, physicians make minimal efforts to foster patient involvement.37 Two factors likely contributed to our findings. First, because our patients’ complaints were mostly of cold or flu-like symptoms or involved OB/GYN exams, physicians would more readily provide full disclosure and share decision making in these characteristic college health center conditions. Second, the major reason typically given by physicians for not fully informing and involving patients is that they would be unable to understand medical information and meaningfully participate in decision making because of lack of education or basic intellectual ability.10 This physician rationalization was likely much less of a factor in the present sample of college-educated patients.

Our patients believed they were able to enact the high level of participation with the provider that they desired. This finding supports our expectation that a closer match between patients’ desired and actual levels of participation are associated with higher levels of patient satisfaction. It also is consistent with other findings9 showing that a close match between what a patient desires and what a patient is able to achieve in the areas of decision making, amount of information received, and interpersonal behavior is important to patients in the medical process. Our finding that higher absolute levels of participation were associated with higher patient satisfaction scores is consistent with numerous findings of an association between greater patient involvement and more positive secondary patient outcomes.3,8

Patients in our study generally desired (and experienced) friendly and submissive providers, but the finding for submission was surprising, given prior findings with diabetes38 and with oral surgery patients,39 in which patient perceptions of physician submissiveness were

<table>
<thead>
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<th>Variable</th>
<th>$B$</th>
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<tr>
<td>PSPS Actual</td>
<td>.393</td>
<td>.068</td>
<td>.515*</td>
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<tr>
<td>IMI Actual affiliation</td>
<td>.264</td>
<td>.076</td>
<td>.309*</td>
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<td>IMI control match</td>
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Note. $R^2 = .488$ for step 1; $\Delta R^2 = .092$ for step 2 ($p < .01$). PSPS = Participatory Style of Physician Scale; IMI = Impact Message Inventory. *$p < .05$. 

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associated with lowered patient satisfaction. These differing findings can be reconciled, however, if one considers the high degree to which our college students wanted to be involved in their health-care process. Patients who want to be more involved, especially those with relatively minor complaints, may desire physicians whom they believe are friendly but more receptive to their demands. In the aforementioned studies, in contrast, patients were dealing with medical situations requiring surgery or structured guidance to manage a chronic disease, were on average older and less educated than our college students, and were thus likely more comfortable with a traditional paternalistic physician.

Our clearest finding regarding interpersonal variables and satisfaction was that patients who viewed their providers as more friendly than hostile were much more satisfied with their visits than were patients who viewed their providers as more hostile than friendly. These data are consistent with numerous prior medical interaction findings.16 However, our expectation that matching provider-patient behavior in the form of greater interpersonal complementarity would be associated with higher satisfaction scores was not realized. None of the 3 complementarity scores (Affiliation, Control, Total) was associated with patient satisfaction. In contrast to previous research in which investigators16 found complementarity to be associated with patient outcomes, our study involved a brief, mostly one-time visit with a provider. Relationship complementarity may have more of an impact in settings where patients have a continuing relationship with the same provider.

One potentially constraining factor in our study was that patient satisfaction scores were positively skewed because our student patients were satisfied with their visits. This ceiling effect was likely facilitated by the fact that all students at the university obtained services free of charge at the Student Health Center, if payments of their health fees remained current. Despite limited variance in patient satisfaction scores, the hierarchical regression findings supported our model, with predictor variables of patients’ perceived levels of participation and the match between their desired and actual levels of participation accounting for more than half of the variance in patient satisfaction. Over the past few decades, researchers have given considerably more attention to secondary outcomes, such as patient satisfaction, and many health-care providers now recognize their importance, even if these secondary outcomes do not enhance primary outcomes as in this study.40 Although we found no support for the notion that increased patient satisfaction leads to increased compliance with treatment recommendations, many other investigators41 have obtained this finding. In addition, increased patient satisfaction may lead to enhanced primary health outcomes through more indirect means, such as more regular visits to the provider or greater levels of disclosure by the patient about relevant medical issues.

In terms of implications for college health services, our findings suggest that patient satisfaction with care is influenced both by the manner in which providers relate to patients and by the extent to which patients view themselves as having been informed and involved in their own care. To the extent possible, providers should be alert to patient preferences on both of these dimensions and during consultations should relate to patients in a manner and provide them with input that matches their preferences.

**Limitations**

Our main limitation was that all measures were self-report. Complete reliance on self-report measures is seldom the most desirable method of data collection, but, in this study, the constraints of the population and study site prohibited tape recordings (and subsequent codings). Measures of some constructs can only be realistically collected by self-report, such as patient satisfaction; others, such as patient compliance, actually lend themselves to more objective collection methods.

Our total lack of findings for the outcome variable of patient compliance could have been caused by the self-reporting of compliance. Researchers41 in many studies examining patient compliance used biological primary outcome measures (eg, urine analyses) to obtain accurate and objective measures of compliance. However, collection of biological compliance data was not feasible in our study. Instead, we assessed the degree to which the patients thought they were complying with the provider’s treatment recommendations rather than the degree to which they were actually complying (eg, actually taking prescribed medication). It is possible to argue that in cases where interpersonal complementarity and match of preferred level of participation relate to patient satisfaction, it is the degree to which patients think that they are complying with the treatment recommendations that is actually the more important factor. All the independent variables we thought might influence patient compliance were conceptualized as acting on the patient’s desire to comply with treatment recommendations rather than on actual compliance. Nevertheless, we did not find patient compliance to be related to any of our study variables; a more objective measure may have produced different results.

Finally, we did not address other possible determinants of patient satisfaction. We did not account for activities and contacts that occur before the visit with the provider, such as time spent in the waiting room, number of forms needed to be completed before the visit, and interactions with the health center staff. It is possible that factors such as these may have a substantial impact in a setting where the patients see the provider only once in contrast to being less relevant in a setting in which the patients visit the same provider over an extended period of time. Patients who are annoyed at waiting for a long period of time before seeing a physician for only one visit might inadvertently evoke a hostile reaction from the provider, in turn significantly altering the patients’ level of satisfaction with the encounter. Investigators in future studies examining patient satisfaction might need to take these contextual variables into account.
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NOTE

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