

# The Importance of Self-Assessed Health in Patients with Diabetes

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The role of self-assessment of health was compared in 150 diabetic and nondiabetic male outpatients matched for age and race. Data were collected (1) directly from the patient at intake into the study and then again in 2 mo, (2) from the medical record, and (3) from the physician. Variables included background information, symptomatology, satisfaction with care, attitudes, use of medical facilities, medications, diagnoses, compliance and physician's estimate of patient's compliance, current health, and whether improvement was expected. A  $2 \times 2$  factorial design was used to compare diabetic and nondiabetic patients with good and poor perceptions of health. Diabetic patients who viewed their health as poor had significantly more clinic visits, greater symptomatology, and were less satisfied with the doctor-patient relationship. The physician's rating of health did not confirm that this group actually had poorer health than the diabetic patients who perceived their health as good, and there was no difference in number of diagnoses between these groups. Data suggest that self-health perception is an important variable in diabetic patients. For those who see their health as poor, there may be a lack of concordance between patient and physician, which may result from these patients being more negativistic and difficult to treat. This may represent a group for whom a different type of treatment approach is needed.

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The way a patient feels about his or her health is important in all types of illness, since it relates to whether the patient seeks treatment, is satisfied with care, or to a certain extent complies with treatment. However, self-health perception may influence treatment even more in diabetes mellitus than it does in other illnesses. The long-term nature of the illness, with its emotional components and the need for continued doctor-patient interaction and concordance, affects the patient's feelings about his health. A good perception of health is probably similar to a good self-concept, in that it is associated with a better overall emotional state and adjustment. In diabetes, a good emotional state may therefore correlate highly with better control and fewer complications from the disease.

Considerable research has been done regarding self-assessed health.<sup>1-6</sup> In general, it has been shown to be marginally correlated with physician-rated health. It has been found to be stable in terms of test-retest reliability. Self-assessed health is predictive of objective health measures as well as of outcome when studied in patients undergoing open heart surgery.

Little work has been done on the medical correlates of good and poor health perception. It seems likely that symptoms tell both the patient and physician something about health status. Conversely, how one feels about one's health, whether it is valid or not, may help to determine symptoms and functional status. A view about health may also be influenced by the person's perception of his physician's attitudes and expectations about his illness. Furthermore, the patient's confidence in his physician, his attitude about the physician's competence, and his general satisfaction with care may also explain some of his feelings about his health.

It also seems that perception of health would be related to health actions such as use of medical services and compliance with treatment. Rosenstock<sup>7</sup> was the first to point out that patients must understand that they are susceptible to an illness and that the illness is potentially severe for compliance to take place. However, the health belief model would not seem to require that a patient view his health as poor but rather that with treatment his condition is hopeful.

Others<sup>8-11</sup> have suggested that use of medical services and compliance with care was influenced by the doctor-patient relationship. Factors such as the practitioner's concern,

warmth, competence, and the fact that the patient's expectations of care were met have been cited as important.

The purpose of the present study was to compare good and poor perception of health in diabetic and nondiabetic outpatients in terms of differences in health behaviors (use of medical services and compliance) and whether factors such as symptoms, satisfaction with care, physician attitudes, and expectations differed between good and poor perceptions of health in each group. The belief was that these variables would account for greater differences between good and poor health in diabetic patients than in similar patients with other diagnoses. The following hypotheses were tested. When a diabetic patient views his health as poor, he will be more likely than those who perceive their health as poor in other diagnostic groups to (1) use more medical services, (2) have more psychoneurotic symptoms, (3) be less satisfied with care and less in concordance with his physician, and (4) be less compliant with his medical regimen.

#### METHOD

Male patients with a diagnosis of diabetes who attended an ambulatory care clinic in the Miami VA Medical Center were studied. They were randomly selected from patients who attended ambulatory care at different hours of each day of the week to insure a representative sample. Patients were interviewed if they signed an informed consent form. Diabetic patients were matched for sex, age, and race with nondiabetic patients attending the same ambulatory clinic.

Patients supplied demographic and health history information including age, race, marital status, education, number in household, occupation, hours employed, estimate of number of visits to the clinic in the past year, number of hospitalizations, use of a non-VA physician, number of medications, and miles from the clinic. Social class was computed with Hollingshead's Two Factor Index,<sup>12</sup> which uses a one- to five-point scale, with the highest score being the lowest social class. Patients were also asked to estimate their overall health, ranging from very good to very poor, on a five-point scale.

Patients completed three scales measuring symptoms, satisfaction with care, and attitudes. The Hopkins Symptom Checklist (HSCL)<sup>13</sup> of 45 symptoms, such as headaches, poor appetite, loss of sexual interest or pleasure, soreness of muscles, and feeling tense, was used. The items are scored on a four-point scale from none to extremely severe, with a higher score indicating more of a symptom. The scale produces five-factor scores, which measure dimensions of somatization, obsessive-compulsiveness, interpersonal sensitivity, depression, and anxiety. Patients also completed the 42-item Attitudes Toward Physicians and Primary Care Scale.<sup>14</sup> This instrument assesses satisfaction with care in three discrete areas: professional competence of the physician, personal qualities of the physician, and cost/convenience of care. Items were rated on five-point scales with a higher score indicating a more negative attitude. Examples of items are "people do not know how many mistakes doctors really

make," "doctors should be a little more friendly than they are," or "people complain too much about how hard it is to see a physician." Lastly, patients responded to three semantic differentials<sup>15</sup> measuring attitudes toward doctor, medical care, and medicines. Ten bipolar adjectives were scored on seven-point scales for each of the three concepts, with a higher score being more negative.

These data were collected before the patient was seen by his physician. Fourteen full-time physicians provide the care in the clinic. Patients are assigned to one physician, and in almost all cases, the patients are seen by the same physician each time they come to the clinic. The patient's physician rated the following three items: health status of the patient, using the same five-point scale as that used by the patient to express self-assessed health; expectation of health status in 2 mo as being the same, better, or worse; and an estimate on a three-point scale as to whether the patient would comply with the medical regimen prescribed.

Medical records were abstracted for all diagnoses. Number of outpatient visits in the past year; number of hospitalizations; whether the Problem Oriented Medical Record format had been used; number, kind, and amount of medications currently prescribed; all other treatments prescribed; laboratory work performed; and return appointments were all noted.

Patients were interviewed in their homes 2 mo from the date of their outpatient visit. They estimated their health again on the same five-point scale. They also evaluated the treatment they had received on a four-point scale, ranging from very helpful to not helpful at all. Patients were asked to show the interviewer all the medications they were currently taking, and pill counts were done. The patient was also asked to describe what he had been told about taking the medication, whether he had taken his medications as prescribed all or part of the time, and reasons for noncompliance when applicable. Final judgment of compliance was made by a physician, who compared the medications prescribed in the records with amount and kind found in the home. If the patient said he had not complied or if the physician identified noncompliance on any one of the prescribed regimens, the patient was counted as being noncompliant.

For purposes of analysis, patients were divided into two groups depending on their health perception. On the basis of the five-point self-assessed scale, those who said they thought of their health as poor or very poor were placed in the poor group and all others were counted in the good group. Patients were also divided into groups depending on whether they were diabetic or nondiabetic. Data were analyzed in a 2 × 2 factorial design for multivariate analysis of variance. Multivariate analyses were selected because the data were multivariate and to protect the findings from multiple alpha errors associated with univariate analyses. The analyses determined whether symptoms, satisfaction, attitudes, and compliance differed significantly between (1) diabetic patients and nondiabetic patients; (2) those with good as opposed to poor perceptions of their health; and most important (3) whether there was an interaction between per-

ception of health and diagnostic status (diabetic or nondiabetic). This latter question asked if differences observed between good and poor perception of health in the diabetic group were the same as those for the nondiabetic group. Additionally, the diabetic patients were divided into three groups: those treated with insulin (N = 22), those treated with oral hypoglycemic agents (N = 30); and those for whom neither were prescribed (N = 23). The same comparisons that were studied for the total sample were replicated for good and poor health perceptions in the three diabetic subgroups.

## RESULTS

There were 150 patients studied (75 with and 75 without diabetes). Exactly the same number (32%) in each group said they thought of their health as poor or very poor. The reliability of patient and physician estimate of health was  $r = 0.22$  for the diabetic and  $r = 0.28$  for the nondiabetic group. These estimates were only of borderline significance statistically.

*Demographic and health history data from patients.* The average age of the patients was 62 yr. About 16% of the patients were black. There were no differences between the diabetic and nondiabetic groups on demographic and health history variables (Table 1). However, patients who perceived their health as poor had less hours employed, more hospitalizations, more medications, more medications plus other treatments, and saw the physician more recently. The number of visits to the clinic during the past year, as estimated by the

patient, was twice as high for the diabetic group who perceived their health as poor than for any other group. Thus, there was a statistically significant interaction between perceived health and diagnosis for frequency of clinic visits ( $P < 0.01$ ).

*Data from medical records.* Diabetic patients were different from nondiabetic patients in that they had almost three times as high a rate of arteriosclerotic heart disease. Nondiabetic patients had significantly more arthritis. However, the groups were similar in that these two conditions and five others were the seven most frequent diagnoses in each group. There were no differences in the rate of hypertension, peptic ulcer disease, anxiety, EENT conditions, and skin problems. Data collected from records are shown in Table 2. As might be expected, diabetic patients had more total regimens prescribed (probably diet in addition to medications), more return appointments, and more laboratory work performed than nondiabetic patients. Patients who thought of themselves as in poorer health had more diagnoses, more outpatient visits, and more total treatments prescribed. The actual number of clinic visits in the past year was more for the diabetic patient who perceived his health as poor. The number of visits recorded in the record (Table 2) was about two less than the patient himself had estimated (Table 1).

*Patient ratings of symptoms, satisfaction with care, and attitudes.* Data from the scales measuring symptoms, satisfaction, and attitudes are presented in Table 3. Surprisingly, diabetic and nondiabetic patients reported about the same pattern of symptoms as measured by the Hopkins Symptom Checklist. In essence, no significant differences were found

TABLE 1  
Demographic and health history variables

Variables	Diabetes (self-perceived health)		Nondiabetes (self-perceived health)		F-ratios		
	Poor (N = 24)	Good (N = 51)	Poor (N = 24)	Good (N = 51)	Main effects		
					Diabetes vs. non-diabetes	Self-health: good vs. poor	Interaction of diagnosis × health
Age	61.42	63.78	63.71	61.22	0.32	0.00	1.62
Black*	0.25	0.08	0.20	0.12	0.00	3.08	0.95
Education	9.71	10.71	10.42	11.24	1.02	2.13	0.02
Married*	0.96	0.98	0.92	0.94	0.32	0.09	0.00
Spouse in home*	0.79	0.73	0.63	0.75	0.27	0.11	1.32
No. in home	1.21	1.06	1.08	1.51	2.38	0.56	2.42
Hours employed (wk)	1.46	13.08	5.00	7.79	0.83	6.21‡	2.33
No. clinic visits (yr)	12.42	5.37	5.88	5.73	2.76	9.06‡	8.31‡
No. hospitalizations	0.63	0.25	0.38	0.16	0.96	3.39†	0.23
Private M.D.*	0.38	0.31	0.25	0.33	0.12	0.01	0.77
No. medications taken	5.50	4.02	5.29	3.63	0.84	16.41§	0.06
No. VA prescribed	5.21	3.73	5.08	3.51	0.28	16.54§	0.01
Miles from hospital	17.79	20.47	13.95	17.83	0.84	0.86	0.02
Last seen M.D.	1.63	1.71	1.42	1.78	0.02	6.20‡	2.53
Multivariate F					1.07	2.26‡	1.88†

\* These variables can be read as percent yes. Last seen M.D. is scored as: 1 = less than 1 mo ago to 4 = over a year.

†  $P < 0.05$ ; ‡  $P < 0.01$ ; §  $P < 0.001$ .

TABLE 2  
 Data from medical records

Variables	Diabetes (self-perceived health)		Nondiabetes (self-perceived health)		F-ratios		
	Poor (N = 24)	Good (N = 51)	Poor (N = 24)	Good (N = 51)	Main effects		
					Diabetes vs. non-diabetes	Self-health: good vs. poor	Interaction of diagnosis × health
No. diagnoses	4.85	4.04	4.91	3.26	2.96	15.19§	1.74
No. clinic visits (yr)	10.45	5.23	5.96	5.00	2.95	9.08‡	4.68†
No. hospitalizations (yr)	0.10	0.44	0.29	0.21	0.24	0.32	1.04
Total hospitalizations	1.95	1.92	2.63	1.83	0.15	1.05	0.80
POMR used*	0.90	0.88	0.83	0.83	0.74	0.04	0.02
No. medications	4.05	3.79	4.00	3.06	1.95	2.43	0.73
No. medications and treatments	4.45	4.08	4.25	3.13	3.43†	3.39†	0.82
Lab. work done*	0.75	0.85	0.54	0.55	12.66§	0.50	0.31
Return appt.'s given*	0.90	0.98	0.79	0.89	3.59†	3.00	0.04
Multivariate F					2.15†	2.51‡	0.98

\* These variables can be read as percent yes.

† P < 0.05; ‡ P < 0.01; § P < 0.001.

 TABLE 3  
 Symptoms, satisfaction, and attitudes measured at baseline

Variables	Diabetes (self-perceived health)		Nondiabetes (self-perceived health)		F-ratios		
	Poor (N = 24)	Good (N = 51)	Poor (N = 24)	Good (N = 51)	Main effects		
					Diabetes vs. non-diabetes	Self-health: good vs. poor	Interaction of diagnosis × health
<b>Symptoms</b>							
Somatization	29.79	20.84	25.61	21.88	0.49	43.52‡	7.24†
Obsessive/compulsive	16.71	12.53	13.91	12.29	2.44	16.21‡	3.07
Interpersonal sensitivity	13.42	9.55	10.17	9.47	3.67*	14.43‡	6.70†
Depression	21.79	16.00	18.39	15.80	2.21	22.89‡	3.27
Anxiety	14.46	9.84	11.65	10.37	0.76	20.17‡	6.27†
Multivariate F for symptoms					0.88	9.24‡	2.28*
<b>Satisfaction</b>							
Professional competence of M.D.	38.38	36.53	36.26	36.35	1.48	1.63	1.88
Personal qualities of M.D.	37.67	35.22	32.52	33.96	7.75†	0.32	4.08*
Cost/convenience	42.88	43.12	43.00	42.49	0.23	0.02	0.19
Multivariate F for satisfaction					3.36*	0.66	2.95*
<b>Attitudes</b>							
Doctor	18.42	17.29	14.65	15.31	4.79*	0.04	0.50
Medical care	17.92	17.14	15.95	16.47	0.61	0.01	0.19
Medicine	16.25	14.64	12.57	15.47	0.22	0.18	2.52
Multivariate F for attitudes					2.06	0.17	1.04
Overall multivariate F					1.14	4.47‡	1.91*

Note: The higher score indicates a more negative response.

\* P < 0.05; † P < 0.01; ‡ P < 0.001.

TABLE 4  
Data given by M.D.

Variables	Diabetes (self-perceived health)		Nondiabetes (self-perceived health)		F-ratios		
	Poor (N = 24)	Good (N = 51)	Poor (N = 24)	Good (N = 51)	Main effects		
					Diabetes vs. non-diabetes	Self-health: good vs. poor	Interaction of diagnosis × health
Health	3.05	2.89	2.86	2.60	5.88†	3.21	0.23
Condition in 2 mo	1.59	1.81	1.82	1.63	0.39	0.02	4.51*
Compliance	1.27	1.19	1.05	1.21	0.43	0.17	1.73
Multivariate F					2.08	1.50	2.80*

Note: Health is scored 1 = very good to 5 = very poor; condition in 2 mo is scored 1 = better, 2 = same, 3 = worse; compliance is scored 1 = yes, 2 = don't know, 3 = no.  
\* P < 0.05; † P < 0.01.

between diabetic and nondiabetic patients on their symptoms (multivariate P = 0.88, NS). When perception of health is taken into account, three differences occurred between the diabetic and nondiabetic patients. As expected, those who perceived their health as poor reported more symptoms on all five factors of the scale. However, for somatization, interpersonal sensitivity, and anxiety, the largest difference occurred in the diabetic group. Diabetic patients who saw their health as poor were much more symptomatic than their nondiabetic counterparts who viewed their health in the same way (P < 0.01).

The only difference reported in satisfaction with care was in relationship to the factor that measured personal qualities of the physician. This factor is often equated with the doctor-patient relationship. Diabetic patients reported more negative attitudes, particularly those who viewed their health as poor.

Somewhat in line with the findings on satisfaction with care was the fact that attitude toward doctor, as measured by the semantic differential technique, was significantly more negative in diabetic patients. Neither the satisfaction scale

nor attitude scales were associated with the patients' perception of health.

When all the variables in Table 3 are assessed together, the overall difference for diabetic versus nondiabetic patients does not reach statistical significance (multivariate F = 1.14). The difference between good and poor self-assessed health is highly significant, and the interaction between diagnosis and perceived health is statistically significant at the 0.05 level (multivariate F = 1.91).

*Information from the physicians.* Physicians viewed the patients differently than the patients viewed themselves, as indicated earlier by the rather low correlations. The same proportion of diabetic and nondiabetic patients (24 out of 75) perceived their health as poor. On the other hand, the data in Table 4 indicated that physicians thought the diabetic patients were in poorer health than the nondiabetic patients at the 0.01 level of significance. Furthermore, there was a significant interaction at the 5% level between diagnosis and self-health assessment concerning the physicians' expectation of the patient's condition 2 mo later. For the diabetic patients, the physicians thought that those patients who

TABLE 5  
Data from home visit

Variables	Diabetes (self-perceived health)		Nondiabetes (self-perceived health)		F-ratios		
	Poor (N = 24)	Good (N = 51)	Poor (N = 24)	Good (N = 51)	Main effects		
					Diabetes vs. non-diabetes	Self-health: good vs. poor	Interaction of diagnosis × health
Health	4.00	2.94	3.88	2.98	0.01	41.95†	0.29
Treatment	1.75	1.55	1.92	1.57	0.27	3.34*	0.23
Compliance	1.58	1.47	1.58	1.38	0.17	1.06	0.08
Multivariate F					0.19	13.86†	0.24

Note: Health is scored 1 = very good to 5 = very poor; treatment is scored 1 = very helpful to 4 = not helpful at all; compliance is scored at 1 = yes and 3 = no.  
\* P < 0.05; † P < 0.001.

viewed their health as poor would be better in 2 mo. For the nondiabetic patients, physicians thought the patients who said their health was poor would be worse in 2 mo. The physicians' estimate of compliance was unrelated to diagnosis or to the patients' self-assessment of health.

**Data from home visit.** Three of the variables collected at the time of the home visit, 2 mo after the baseline clinic visit, are listed in Table 5. The patients' evaluation of their health remained highly stable over time. The correlation between first and second assessment was  $r = 0.81$ . Those who perceived their health as poor tended to give more negative evaluations of their treatment whether or not they had diabetes. There was no significant difference in terms of actual compliance.

By matching the physicians' estimates of compliance with actual compliance, physicians were able to identify only 11% of the noncompliers in the diabetic group and none of the noncompliers in the nondiabetic group.

In examining the medications that the patients were taking, it was evident that they had several more than what had been prescribed in the medical record. Some medicines had been prescribed by physicians in the community, some were nonprescribed drugs obtained by the patient, and some were old medicines that the patient saved and took on his own initiative. The most frequent reason for noncompliance was that a medication made him feel worse. Patients were able to repeat the instruction the physician had given in all

instances. Types of medications were classified into 19 categories and compared between the two groups.

Four types of medications distinguish the diabetic patients from the nondiabetic ones (Table 6). More diabetic patients received pulmonary and skin medications and antibiotics. Three medications differentiated the poor and good health groups. Those who perceived their health as poor more often received digitalis-type medications, laxatives, and sleeping pills. The influence of self-health assessment on diagnosis showed that it was the nondiabetic patients who perceived their health as poor who took more pulmonary medications, laxatives, and antibiotics.

**Comparison between diabetic subgroups.** No significant differences were found when the data were reanalyzed for the three diabetic subgroups: those treated with insulin, those treated with oral hypoglycemic agents, and those for whom neither were prescribed. Neither were any significant interactions found between self-perception of health and type of diabetic medications.

#### DISCUSSION

Some, but not all, of the hypotheses were supported in this study. Diabetic patients with poor health perceptions made more clinic visits than any other group. Therefore, their use of medical services differed significantly. Diabetic patients with poor assessed

TABLE 6  
Percent on medication by good and poor health and diabetic and nondiabetic condition

Variables	Diabetes (self-perceived health)		Nondiabetes (self-perceived health)		F-ratios		
	Poor (N = 24)	Good (N = 51)	Poor (N = 24)	Good (N = 51)	Main effects		
					Diabetes vs. non-diabetes	Self-health: good vs. poor	Interaction of diagnosis × health
Antihypertensive	0.42	0.29	0.25	0.22	2.10	0.99	0.31
Diuretic	0.36	0.39	0.33	0.29	0.03	0.54	0.06
Digitalis	0.29	0.24	0.37	0.14	0.34	3.99*	1.51
Nitroglycerine	0.33	0.20	0.25	0.20	0.15	1.68	0.32
Anticoagulant	0.00	0.00	0.04	0.02	2.01	0.30	0.30
Circulatory	0.13	0.10	0.00	0.04	3.81*	0.02	0.57
Pulmonary	0.00	0.04	0.21	0.08	4.98*	1.02	3.56*
Antispasmodic	0.17	0.16	0.29	0.22	1.48	0.37	0.22
Laxative	0.21	0.12	0.50	0.14	2.92	11.50‡	4.14*
Arthritis	0.29	0.24	0.13	0.18	1.97	0.00	0.57
Skin	0.13	0.06	0.21	0.20	4.51*	0.42	0.20
Tranquilizer	0.75	0.41	0.62	0.59	1.00	4.81*	3.10
Seizure	0.17	0.02	0.04	0.02	1.40	5.45*	2.97
Pain	0.46	0.43	0.67	0.53	2.66	0.88	0.39
Antibiotic	0.00	0.04	0.29	0.12	9.67†	1.77	4.45*
Allergy	0.13	0.12	0.13	0.02	2.11	1.31	0.99
Nutrition	0.38	0.39	0.33	0.24	2.44	0.24	0.49
Sleep	0.25	0.12	0.29	0.16	0.40	3.95*	0.00

\*  $P < 0.05$ ; †  $P < 0.01$ ; ‡  $P < 0.001$ .

health tended to have more somatization, more problems in interpersonal sensitivity, and more anxiety than nondiabetic patients with poor health assessments. However, the major differences in symptoms were observed between good and poor health in general for both diagnostic groups. The hypothesis that poor health perception in diabetic patients would accompany more dissatisfaction with care for that group than any other was supported, along with this group's attitudes being more negative. The hypothesis that beliefs about health would influence compliance was not supported. Although compliance was in the direction of poor health perception being less compliant, the diabetic patient with poor health perception was essentially the same as the poor health perception group with other diagnoses in terms of rate of compliance.

Although differences between diabetic and nondiabetic groups and between good and poor health assessments were of interest, the primary question in this article was whether self-health assessment affected diabetic patients differently than persons with other types of illness. The answer appears to be yes. Diabetic patients who viewed their health as poor made more clinic visits and experienced more symptoms of a psychoneurotic nature (specifically more somatization, more impaired interpersonal sensitivity, and more anxiety). They were also less satisfied with the doctor-patient relationship, as measured by personal qualities of the physician, compared with those nondiabetic patients who saw their health as poor. Physicians expected diabetic patients who perceived their health as poor to be more improved in 2 mo. Although physicians rated patients with diabetes as having poorer health, their assessment of diabetic patients who saw their health as poor was no different from their assessment of diabetic patients who saw their health as good. In other words, objective health ratings of physicians did not confirm the validity of poor health perception in the diabetic group. There is some reality in the way persons perceive their health in that it is what they actually experience. Physicians expected the diabetic patients who saw their health as poor to be more improved in 2 mo than any other group. These patients did not perceive themselves to be thus improved, although they were no less compliant.

Given these findings, it is difficult to say whether diabetic patients who viewed their health as poor were actually more severely impaired. The fact that they experienced more psychoneurotic symptoms may be related to the way they view their health or it may be related to other physical factors. The other diagnoses were similar in the remaining three groups. For some reason, the physicians expected the diabetic group with poor self-assessments of health to make more improvement. On the other hand, these patients evaluated the doctor-patient relationship less favorably. Is it the lack of concordance between patient and physician that results in these findings? These patients were coming in more frequently for care and had more symptoms of a psychological nature; yet the physician believed that they should improve more than the other patients. Is it possible that these patients felt their problems were not understood? Another

possible explanation is that the physicians may react differently to these patients. They represent a group of patients who are more difficult to treat in that they tend to concentrate on bodily symptoms, lack interpersonal skills in dealing with others, and express more anxiety about themselves. These patients, in fact, generally may be more negativistic. Not only do they see the doctor-patient relationship less positively, they also evaluate the professional competence of the physician, the doctor in general, medical care, and medicines less favorably (although not to a statistically significant degree) than do the other groups.

The fact that noncompliance was not greater for diabetic patients who saw their health as poor suggests that compliance may not be so strongly related to the doctor-patient relationship, since they rated the relationship less favorably. There have been conflicting reports concerning the importance of the doctor-patient relationship in terms of patient compliance with medical regimens. Furthermore, why poor health assessment, particularly in diabetic patients, is not related to their being more compliant remains to be evaluated. The health belief model proposed by Rosenstock<sup>16</sup> and elaborated more recently by Becker and Maiman<sup>17</sup> suggests that one of the requirements for compliance is that the patient perceive his illness as serious. It would seem that diabetic patients with poor health assessments did. However, another requirement of the health belief model is that patients have confidence that the medical treatment can alter their condition positively. There is an indication here that this group did not see the health system, more specifically their physician, as providing this result.

If patient satisfaction with care is considered an important part of overall quality of care, then this group of patients could be targeted for intervention designed to alter their less favorable attitudes toward care. In view of their psychoneurotic symptoms, it would seem that these patients might find some type of therapy an effective means of improving their psychological state as well as their attitudes about medical care.

In summary, knowing how the diabetic patient views his own health can help in identifying problem areas and could aid the physician in planning care and making appropriate referrals for counseling.

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#### REFERENCES

- <sup>1</sup> Linn, M. W.: Studies in rating the physical, mental and social dysfunction of the chronically ill aged. *Med. Care* 14: 119-25, 1976.
- <sup>2</sup> Linn, B. S., Linn, M. W., and Knopka, P.: The very old patient in ambulatory care. *Med. Care* 16: 604-10, 1978.

- <sup>3</sup> Maddox, G. L.: Some correlates of differences in self-assessment of health status among the elderly. *J. Gerontol.* 17: 180-85, 1962.
- <sup>4</sup> Suchman, E., Phillips, B., and Streib, G.: An analysis of the validity of health questionnaires. *Social Forces* 36: 223-32, 1958.
- <sup>5</sup> Maddox, G. L.: Self-assessment of health status. *J. Chronic Dis.* 17: 449-60, 1964.
- <sup>6</sup> Friedson, H. J., and Martin, H. W.: A comparison of self and physicians' health ratings in an older population. *J. Health Soc. Behav.* 4: 179-83, 1963.
- <sup>7</sup> Rosenstock, I.: Patients' compliance with health regimens. *JAMA* 234: 402-03, 1975.
- <sup>8</sup> Davis, M. S., and Eichhorn, R.: Compliance with medical regimens: a panel study. *J. Health Hum. Behav.* 4: 240-46, 1963.
- <sup>9</sup> Korsch, B., Gozzi, E., and Frances, V.: Gaps in doctor-patient communication. 1. Doctor-patient interaction and patient satisfaction. *Pediatrics* 42: 855-71, 1968.
- <sup>10</sup> Hulka, B. S., Cassel, J. C., Kupper, L. L., and Burdette, J. A.: Communication, compliance and concordance between physicians and patients with prescribed medications. *Am. J. Public Health* 66: 847-53, 1976.
- <sup>11</sup> Komaroff, A. L.: The practitioner and the compliant patient. *Am. J. Public Health* 66: 833-35, 1976.
- <sup>12</sup> Hollingshead, A. B.: Two factor index of social position. Mimeograph, New Haven, Conn., 1957.
- <sup>13</sup> Derogatis, L. R., Lipman, R. S., Rickels, K., Uhlenhuth, E. H., and Covi, L.: The Hopkins Symptom Checklist (HSCL): a self-report symptom inventory. *Behav. Sci.* 19: 1-15, 1974.
- <sup>14</sup> Hulka, B. S., Zyzanski, S., Cassel, J. C., and Thompson, S.: Scale for the measurement of attitudes toward physicians and primary medical care. *Med. Care* 8: 429-34, 1970.
- <sup>15</sup> Osgood, C. E., Suci, G. J., and Tannenbaum, P. H.: *The Measurement of Meaning*. Chicago, University of Illinois Press, 1957.
- <sup>16</sup> Rosenstock, I. M.: Historical origins of the health belief model. *Health Ed. Monog.* 2: 328-473, 1974.
- <sup>17</sup> Becker, M. H., and Maiman, L. A.: Sociobehavioral determinants of compliance with health and medical care recommendations. *Med. Care* 13: 10-24, 1975.