A Scale for Assessing Health Care Providers' Teaching and Communication Behavior Regarding Asthma

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Partnership between health care providers and patients is important for controlling illness. A limited number of studies show how to assess health professionals' communication and partnering behavior. The relationship between these aspects of professional behavior and enhanced management of disease by patients has received little empirical study. The research reported here developed a Health Care Providers' Teaching and Communication Behavior (TCB) scale for assessing the teaching and communication behavior of clinicians treating patients with asthma. Such a tool is needed for research related to provider-patient relationships and for evaluation of professionals' performance.

The need for health care providers to teach their patients about asthma and enter into partnerships for management has been widely discussed.[1] These partnerships require that the health professional provide effective counseling and education for the patient. The nature of the provider-patient relationship, especially related to physicians, has been extensively studied. Specific actions on the part of the professional to improve relations with patients both to enhance their self-management of disease and their health status

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have been described.[2-5] However, only a few investigators have examined prospectively whether health provider communication behavior is associated with better clinical outcomes and disease management by patients.[6,7]

Social cognitive theory postulates[8] that to engage in desired communication and teaching behavior, a health care provider must have the confidence (self-efficacy) that he or she can carry out the behavior, and believe that acting in the given way results in a positive and desired outcome (outcome expectation). Further, it has been suggested that being more self-regulating increases the ability to learn skills such as those associated with good communication.[9] Self-regulation refers to the ability to observe one's own behavior, evaluate its effect, and try out new forms more conducive to reaching a desired outcome.

The study discussed here was part of a larger investigation assessing clinical practice and was undertaken to (1) determine if 10 actions recommended in the literature on compliance and provider-patient relationships formed a reliable scale of health care provider communication and teaching behavior in asthma (hereafter called the Teaching and Communication Behavior Scale [TCB]); (2) determine associations, if any, between constructs from social cognitive theory—self-efficacy, outcome expectation, self-regulation—and health care provider behavior as measured by the TCB scale; and (3) examine whether the health professionals' communication and teaching behavior was associated with effective self-management by their asthma patients. General practice pediatricians were of particular interest because they see the bulk of younger patients with asthma, a group with a high degree of morbidity.[10]

METHOD

Sample

Two samples provided data for the study. A large project investigating clinical practice undertaken in Ann Arbor, Michigan, and New York City provided the first sample of physicians (sample 1). Physicians meeting minimum criteria were recruited from the two areas to complete the same questionnaire including the 10 items constituting the TCB scale. The criteria were as follows: (1) primary specialty being general pediatrics, (2) licensed no earlier than 1960, (3) providing direct patient care, and (4) if board specialized, being certified only in pediatrics. These physicians also agreed to provide access to at least five patients each, selected at random from the roster of their pediatric patients with asthma. Children met the following criteria: (1) 1 to 12 years of age, (2) diagnosis of asthma made by a physician, (3) no other chronic disorders with pulmonary complications, and (4) at least one emergency medical visit in the previous year. A total of 74 physicians provided data, and 637 parents (one per family) of their patients were also enrolled in the study. The majority of physicians were male (60%). The ages of physicians were distributed as follows: 30-39 (22%), 40-49 (37%), 50-59 (27%), and 60 and older (14%). Study physicians were divided between solo (57%) and group practice (37%), with 6% in multispecialty practices. Almost 70% (69.7%) of the patients were boys. About one-third of the patients were from families representing populations of color (Black 15%, Latino/Latina 12%, Asian 2%, Native American 1%, other 4%). Ninety percent of the parents had graduated from high school or had higher levels of education.

In order to generate, in a systematic way, additional data beyond the two sites represented in sample 1 and to enable a test-retest reliability assessment of the teaching and communication scale, a second, national sample was drawn (sample 2). The roster

of the American Medical Association and the *U.S. Medical Directory* (8th edition) were used to select a sample of physicians at random in equal numbers from three categories of community. The first category was university towns like Ann Arbor. The second was cities of 1.5 million or more that would have patient heterogeneity somewhat like New York City. The third was all other U.S. geographic areas. Recognizing that less than half of the individuals contacted would be likely to respond, and to ensure a large enough response to enable statistical analysis, 271 names were identified. To assess the test-retest reliability of the instrument, responding individuals were sent the questionnaire to complete a second time, 2 weeks after they returned the first. A total of 79 physicians sent back the questionnaire. Forty completed it a second time, allowing us to determine if physicians responded to scale items the same way on each occasion.

The physicians in both samples are individuals willing to provide information. The patients and their parents constitute a random sample of eligible participants. All procedures for obtaining data from respondents followed University of Michigan Institutional Review Board guidelines for human subjects investigations.

Measures

Behaviors shown in the literature (see e.g., Becker[2,3,4] and Clark et al.[5]) to be associated with patients' learning, enhanced provider-patient communication, and/or improved patient compliance reflected the items of the Health Care Providers' Teaching and Communication Behavior (TCB) scale, which inquired about the frequency of the physicians' use of the 10 selected communication and education strategies (see Table 1). The scale was included in a larger questionnaire that assessed other aspects of physician behavior. In order to test the association of constructs from social cognitive theory with providers' behavior, the same 10 items of the TCB, with different introductory statements, were used to determine the extent to which physicians had confidence (self-efficacy) to use the strategies, and believed the strategies helped them to educate their patients (i.e., met their outcome expectations). In addition to these items, the study questionnaire also assessed the health care providers' efforts to be self-regulating, that is, observe and evaluate their own behavior when educating patients. Table 2 presents items from the questionnaire related to physicians' self-regulating behavior. The questionnaire was mailed to physicians at their offices and was self-administered. The TCB scale portion of the questionnaire takes approximately 5 minutes to answer. Not every behavior comprising items of the scale is appropriate to every cultural subgroup of the U.S. population, but the actions are thought to serve as general guidelines.

Parents of the sample of children with asthma providing data for the study were interviewed by telephone. The parent questionnaire inquired about experiences in receiving asthma care from the sample pediatricians and about family self-management activities including pharmacologic and nonpharmacologic means for preventing and managing exacerbations of asthma. It was based on a questionnaire used extensively by investigators in previous studies.[11]

Data Analysis

Cronbach's alpha and Spearman rank-order correlation coefficients were computed on data from sample 2 to ascertain properties of the TCB scale. The correlation between the

Table 1.   Health Care Providers' Teaching and Communication Behavior Scale[a]

How Often Do You Use Each Strategy With Your Asthma Patients?	Never				Always	
1. Show nonverbal attentiveness	1	2	3	4	5	6
2. Give nonverbal encouragement	1	2	3	4	5	6
3. Give verbal praise for things done well	1	2	3	4	5	6
4. Maintain interactive conversation	1	2	3	4	5	6
5. Find out underlying worries/concerns	1	2	3	4	5	6
6. Give specific reassuring information	1	2	3	4	5	6
7. Tailor medication schedule to family's routine	1	2	3	4	5	6
8. Reach agreement on a short-term goal	1	2	3	4	5	6
9. Review the long-term therapeutic plan	1	2	3	4	5	6
10. Help patient to use criteria for making decisions about asthma management	1	2	3	4	5	6

a. The same items were used to assess physicians' self-efficacy to use these strategies and to assess outcome expectations, that is, their perceptions of how helpful each is. The lead question differed as follows: "How confident are you in your ability to use [the strategy]?" (self-efficacy; 1 = *no confidence*, 6 = *complete confidence*), "How helpful do you believe [the strategy] is?" (outcome expectation; 1 = *not useful*, 6 = *very useful*).

Table 2.   Self-Regulation Items[a]

When Seeing a Child With Asthma, Do You Routinely Use Any of the Following Self-Monitoring Techniques?

1. Try to be aware of your communication behavior during your interactions with patients?
2. Observe patients' reactions as a cue to the effectiveness of your own communication behavior?
3. Use a system to assess your communication with patients?
4. Try different communication techniques to see if they improve your communication with patients?
5. Check with patients to see if the information you've given them has been put into practice?
6. Use some sort of protocol to keep track of what you have communicated about asthma and what else you need to cover?

NOTE: Possible responses were as follows: 1 = *no*, 2 = *rarely*, 3 = *occasionally*, 4 = *very often*.

first and second time the scale was completed was assessed by the Spearman correlations, and intercorrelations among individual items of the scale were assessed by use of Cronbach's alpha. Factor analysis (principal components analysis with varimax rotation) was employed with data from sample 1 to determine if items on the behavioral dimension of the TCB scale clustered into domains. Associations between scores on the teaching and communication behavior scale, and those related to constructs from social cognitive theory (i.e., self-efficacy, outcome expectation, and self-regulation) and parents' efforts to manage their children's asthma were examined by virtue of Spearman correlations. In these preliminary analyses, where relevant, patient data were calculated as "an average patient" for each physician to correspond to physician data. Modeling to compare physician reports of their own behavior and patients' parents' reports of physician

behavior over time were analyzed using multiple regression (both ordinary least squares and logistic) approaches with baseline physician variables as covariates for corresponding postintervention physician variables. General estimate equations (GEE) to adjust for clustering effects that may occur from several parents reporting the behavior of the same physician were also utilized.

FINDINGS

Reliability and Internal Consistency of the Scale

When the TCB scale items were measured for test-retest reliability, coefficients for items were adequate, ranging from .41 to .66, and all were statistically significant, indicating that responses were similar between the first and second administration of the scale (see Table 3). Items constituting the TCB scale corresponded very well internally with a Cronbach's alpha of .90. Intercorrelation was also good regarding the questionnaire items that assessed physicians' expectations about the outcome of using the strategy, that is, the extent to which physicians believed the communication and education strategies to be useful in educating patients ($\alpha = .89$). Intercorrelation of items that assessed the providers' confidence (self-efficacy) to use the strategies was also strong ($\alpha = .90$).

Association Between Providers' Behavior, Beliefs, and Self-Regulation

Table 4 presents findings of the analysis of data from sample 2, showing relationships between a physician's teaching and communication behavior (i.e., the score on the TCB scale), the extent to which he or she believed the behavior would produce a desired positive outcome in patients, the level of confidence to carry out the behavior, and the level of self-regulation (i.e., attempts to observe and evaluate one's own communication and teaching behavior). A high score on the TCB scale was significantly associated with the belief that the educational strategy would produce useful results ($r = .51$), and the belief that one was capable of carrying it out ($r = .69$). A higher TCB score was less strongly but significantly correlated with being self-regulating ($r = .33$).

Domains of Communication and Education Behavior

Factor analysis demonstrated that the 10 items of the TCB scale clustered into three separate domains. Table 5 presents the results of the analysis. These three factors accounted for 78.7% of the variance in health care providers' responses and comprise related but distinct underlying categories of professional behavior tapped by the scale. A factor of four items labeled *focus on the treatment plan* refers to actions of the health professional designed to inculcate in patients specific skills related to controlling asthma. Four items clustered into a factor labeled *congenial demeanor*. These items tap the extent to which the providers' manner of interaction is directed toward patients' comfort and provides encouragement. Another factor comprising two items is labeled *reassuring communication*. These items tap the extent to which the health care professional tries to reduce patient fears and concerns.

Table 3.   Correlations Between First and Second Completion of Items Constituting
Self-Efficacy Beliefs, Outcome Expectations, and the Health Care Providers' Teaching
and Communication Behavior Scale (TCB)

	Test-Retest Reliability Spearman Correlation Coefficients		
	Confidence	Outcome Expectation	TCB Scale
1. Show nonverbal attentiveness	.61	.50	.42
2. Give nonverbal encouragement	.64	.61	.65
3. Give verbal praise for things done well	.64	.41	.52
4. Maintain interactive conversation	.56	.55	.56
5. Find out underlying worries/concerns	.58	.49	.53
6. Give specific reassuring information	.56	.60	.46
7. Tailor medication schedule to family's routine	.77	.58	.58
8. Reach agreement on a short-term goal	.66	.77	.52
9. Review the long-term therapeutic plan	.58	.65	.41
10. Help patient to use criteria for making decisions about asthma management	.54	.61	.61
Cronbach's alpha	.90	.89	.90

NOTE: Sample 2. Based on the questions: "During a visit by a child with asthma, how confident
are you in your ability to use each strategy?" (self-efficacy); "How helpful do you believe it is?"
(outcome expectation); "How often do you use it?" (TCB scale).

Table 4.   Correlations Among Social Learning Constructs

	How Useful	How Often (TCB)	Self-Regulation
How confident	.70*	.69*	.18
How useful		.51*	.08
How often (TCB)			.33*

NOTE: Sample 2.
*Correlation coefficients statistically significant at $p < .01$.

Relationship of Factors to Patient Behavior

A higher score on one or more of these domains of the scale was theorized to be
associated with higher levels of patient self-management of disease. Sample 1 data were
used to test this assumption. A peak flow meter monitors symptoms and effects of
medicine taking. A statistically significant relationship was evident between the physi-
cians' higher score on the TCB scale and patients being more likely to use peak flow
monitoring (PFM) in efforts to manage their disease (see Table 6). The domain or factor
focus on the treatment plan correlated with patient PFM ($r = .34, p < .01$), as did congenial
demeanor ($r = .34$, $p < .01$) and reassuring communication ($r = .32$, $p < .01$). No
associations were noted with other aspects of asthma self-management such as finding
ways to keep calm, using criteria to make decisions about medication use, and identifying
environmental factors.

Table 5.   Results of Factor Analysis[a] of Items on the TCB

Item	Rotated Factor Pattern[b]		
	Factor 1	Factor 2	Factor 3
Treatment plan focus			
Tailor the medication schedule to patient's routine	85	21	17
Reach agreement on a short-term goal	70	44	27
Review long-term therapeutic plan	83	13	37
Help patient use criteria for asthma management decisions	82	20	20
Congenial demeanor			
Maintain an interactive conversation			
(e.g., ask open-ended questions)	41	61	37
Show attentiveness (e.g., eye contact, attentive listening)	18	88	13
Give encouragement by using nonverbal communication			
(e.g., nodding, smiling, etc.)	16	91	11
Give verbal praise for effective management	26	74	38
Reassuring communication			
Find out patients' underlying concerns about asthma	35	21	86
Give specific reassuring information in response	41	46	58
Variance explained by each factor[c]	31.5%	30.6%	16.6%

a. Factor method: principal components with varimax rotation.
b. Printed values are multiplied by 100 and rounded to the nearest integer.
c. Total = 78.7%.

Table 6.   Domains of Health Care Providers' Teaching and Communication Behavior, and Correlation with Patients' Behavior (Peak Flow Monitoring [PFM])

Factor	Items	Spearman Correlation With PFM[a]
Factor 1: Treatment plan focus	Tailor medication schedule Reach agreement on short-term goal Review long-term therapeutic plan Help patient use criteria for asthma management decisions	.34*
Factor 2: Congenial demeanor	Maintain interactive communication Show attentiveness through nonverbal communication Give encouragement through nonverbal communication Give verbal praise for things done well	.34*
Factor 3: Reassuring communication	Find out patients' underlying concerns about asthma Give specific reassuring information in response	.32*

a. PFM = patient use of peak flow monitoring.
*p < .01.

Verification of Health Care Provider Behavior by Patients

An important question in determining the utility of a measure such as the TCB is whether physicians were accurately reporting their behavior. Direct observation of physician-patient encounters was beyond the scope of this study. Parents' reports of physician behavior were considered a good source of verification; that is, if the physician reported actions and the parent corroborated the physician's observations, the actions could be assumed to have occurred. However, most of the communication and teaching behaviors of interest in this study were subtle. It was likely that parents of patients would not recall or in some cases even notice them. Nonetheless, we determined that several other sufficiently explicit physician actions would be remembered by parents (e.g., being given a prescription for inhaled corticosteroid) or would be acted upon by parents at home (e.g., know how to make asthma management decisions). If both physician and parent agreed on these actions, we could assume physicians were reasonably accurate reporters of their own behavior. As they had no reason to report their communication and teaching behavior differently than other actions, these data could also be accepted as accurate.

The following procedure was used. From the parent-provided data in sample 1, 8 continuous and 15 dichotomous variables were selected for analysis. These variables related to specific actions taken by the physician that parents were expected to recall or directly attribute to the physician. Data related to the same items were also available from the physician questionnaire. These included prescribing inhaled anti-inflammatory medicine; asking the patient to demonstrate the use of medicines; writing down plans and instructions; spending adequate time with the patient; providing guidelines and materials for managing asthma at home; relieving a parents' pressing worries and concerns; and enabling parents to make management decisions, know what to do before the next visit, and understand the treatment plan. Data from two groups of physicians within sample 1 were analyzed. The first group comprised the sample of physicians ($n = 35$) who had been randomly assigned to receive education related to their communication and teaching behavior as part of the larger investigation of clinical practice. The second group comprised the sample ($n = 34$) who had been randomly assigned to serve as control. We reasoned that physicians in the education group who had learned how to make changes to facilitate interaction with their patients would report change in their behavior significantly more often than control physicians, and that their patients' parents would also be significantly more likely than control parents to report that particular physician behavior. Scores on the selected actions parents were expected to remember or attribute to the physician were computed for program and control group physicians and parents ($n = 260$ program, $n = 220$ control) using multiple regression (ordinary least squares and logistic models) and general estimate equation (GEE) analyses, always controlling for baseline scores.

Table 7 reports means and odds ratios between the two groups and illustrates the degree of convergence in the responses of parents and physicians. Parents whose physicians were in the education group reported significantly more often than controls that (1) the physician prescribed inhaled anti-inflammatory medicine, (2) the physician made efforts to relieve their fears and worries, (3) they knew how to make management decisions after seeing the physician, and (4) during the visit the physician asked the child to show how to use an inhaler. These same behaviors were reported significantly more often by physicians in the treatment group compared to control group physicians. One exception was providing written instructions for using a nebulizer, where more patients of control physicians reported being given instruction, a finding which may indicate these physi-

Table 7.   Comparison of Physicians' and Parents' Reports of Change

| | Means/Odds Ratios[a] | | | | |
Item	Treatment	Control	Odds Ratio	p	p Value of GEE[b]
MD: Gave inhaled anti-inflammatory therapy[c]	67.8	56.3		**.044**	
Parent: Doctor gave inhaled anti-inflammatory medicines[c]	82.7	70.3		**.018**	**.01**
MD: Addressed patients' specific fears	5.1	4.7		**.026**	
Parent: Doctor gave information to relieve worries	4.1	3.9		**.009**	**.007**
Doctor asked about concerns	3.0	3.1		.167	.230
MD: Provided guidelines for management[c]	80.4	65.3		**.003**	
Parent: After visit knew how to make management decisions	4.3	4.2		**.015**	**.07**
Had idea of what is to be done before next visit	4.4	4.3		.412	.56
Knew treatment plan	4.0	3.9		.147	.36
Given educational materials			.817	.33	.21
MD: Went over instructions for new medicine at end of visit	5.0	4.4		**.012**	
Parent: Doctor asked child to show how to use:					
Inhaler			2.056	**.065***	**.073***
Inhaler with spacer			.889	.79	.84
Nebulizer			1.139	.77	.95
Peak flow meter			1.655	.29	.19
MD: Gave written instructions for new medicine	4.5	3.9		**.058**	.19
Parent: Doctor reviewed written instructions on:					
Inhaler			.799	.42	.65
Inhaler with spacer			.759	.34	.32
Nebulizer			.647	**.082****	.13
Peak flow meter			.898	.75	.87
MD: Wrote down how to adjust medicine when symptoms change	4.3	3.5		**.007**	
Parent: Doctor gave written instructions	3.6	3.9		.19	.19
Doctor gave written plan			1.026	.91	.85

NOTE: All parent means are derived from 5-point scales (higher score = *more positive*); all MD means are derived from 6-point scales (higher score = *more positive*). GEE = general estimate equation.

a. Means are reported for all scaled variables, and odds ratios are reported for dichotomous variables. Ordinary multiple regressions (analyses of covariance with corresponding baseline variable and a group indicator as predictors) for continuous variables and odds ratios (logistic regressions) for dichotomous variables were used to obtain the difference between treatment group and control group at follow-up, controlling for baseline. All p values less than .10 are in bold.

b. GEE was used to adjust the clustering effect that may result due to data from several patients describing the behavior of the same physician. Ordinary multiple regressions (analyses of covariance with corresponding baseline variable and a group indicator as predictors) was used for continuous variables, and logistic regression was used for dichotomous variables.

c. MD = percentage of physicians' patients treated with inhaled anti-inflammatories and given guidelines for management. Parent = percentage of patients reporting being given anti-inflammatory prescriptions.

*Treatment significantly more likely to report change.

**Control significantly more likely to report change.

cians prescribe nebulizers more often. Most of the other selected items, while not reaching statistical significance, were in the direction consistent with hypothesized associations. In the group where physicians were not educated, that is, new physician behavior was not expected and therefore not expected to be observed by patients, with the exception of nebulizer instruction, neither physicians nor parents reported the selected behaviors significant more often than the treatment group.

Table 7 also reports results of a general estimate equation analysis that accounted for any clustering of responses that might occur because several patients were reporting behavior of the same physician. In the GEE analysis, regarding inhaled anti-inflammatory medicine, parents and physicians in the treatment group reported significantly more frequent prescriptions than in the control group. Similarly, physicians and these parents more frequently reported having their worries relieved, knowing how to make decisions, and the child being asked to show how to use an inhaler. Most other selected items, although not statistically significant, were also in the hypothesized direction. Table 7 presents a pattern of convergence of reports. Parents' responses in analyses were consistent with physicians' reports of their own behavior. These findings suggest that physicians were providing reasonably accurate descriptions of their actions when completing the study questionnaire and, therefore, can be assumed also to have been reasonably accurate in reporting their communication and teaching behavior on the TCB scale.

DISCUSSION

If improving the dismal statistics associated with morbidity and health care use for asthma depends on a good provider-patient partnership, clinicians need to understand the elements of these partnerships. Of course, central features are correct diagnosis and a good therapeutic regimen. But there is general agreement that more is required. The items of the TCB scale constitute the added elements thought to be requisite for creating partnership. The flow of information between participants in the provider-patient encounter must be rich enough to enable the health care professional to discern the unique characteristics of disease in the particular patient and construct a therapeutic plan the patient and family can accept and follow. The patient must be helped to feel comfortable so that the right level of candor is reached. Patients need to feel that their underlying worries and concerns have been addressed so that they are not distracted from hearing what the health professional has to say and from participating in collaborative problem solving. Patients need reassurance and encouragement from professionals so they can develop confidence in their own ability to manage disease at home, given guidance. The health care provider must also help patients develop knowledge and skills related to the treatment plan that enables them to manage disease over time. The patient and clinician must agree on the short- and long-term goals of therapy. The patient must act on the plan as the clinician recommends. Action depends on knowing when and how the regimen is to be adjusted when circumstances change.

Findings from the study described here suggest that the Health Care Providers' Teaching and Communication Behavior scale is a reasonably good vehicle for succinctly describing and assessing behavior of professionals that enhances interactions with patients. While a variety of provider behaviors have been discussed in the literature as important, heretofore no systematic effort to combine and measure the behaviors empirically has been undertaken. The properties of the TCB scale indicate that it is worthy of further consideration. It is reliable and internally consistent. A most appealing feature is

the strong face validity of the three domains it comprises (congenial demeanor, reassuring communication, treatment plan focus). These, in the everyday experience of health care providers, are likely to be associated with positive patient encounters. However, because the study focused on behavior of physicians, care must be exercised in extending results to other types of providers. Additional research to affirm the scale's relevance to other disciplines is needed.

Two constructs from social cognitive theory, self-efficacy, and outcome expectation are reasonably well correlated with the TCB scale. These associations provide a good theoretical underpinning for the scale, since the constructs have been shown in many studies over time to be predictive of behavior.[8] A third construct, self-regulation, showed a lower degree of correlation, but an association in the right direction and of statistical significance.

Perhaps the most important question to ask about a professional's skill as communicator and teacher is whether it is associated with changes in patient behavior. Each of the three domains of the scale examined here correlated with at least one strong indicator of patient management of asthma: peak flow monitoring. While associations with some other types of asthma management behavior were not noted, a fuller exploration of the ways in which the scale itself and combinations of its constituent parts may predict different aspects of patient self-management seems warranted.

The scale suggests skills and techniques that may well be needed in health professionals' training. Findings also suggest that basic and continuing education for providers may need to address two sometimes overlooked dimensions of teaching and communication. First, train health care professionals in such a way (perhaps through demonstration, rehearsal, and/or coaching) that they develop the confidence (self-efficacy) associated with trying new behavior. Second, enable health care providers to see the relationship between using this or a similar set of communication and education skills and realizing desired changes in patient's behavior.

The Health Care Providers' Teaching and Communication Behavior (TCB) scale may prove to be a useful measure of the health professional's attempt to engage patients in communication and education, leading to a partnership for chronic disease management. It has good test-retest reliability and has a high degree of internal consistency. Its items cluster into domains that have strong face validity as ways to instruct, reassure, and close the social distance evident in patient-provider encounters. It is significantly associated in the expected direction with constructs from social cognitive theory shown to predict behavior. Further, it correlates with a strong indicator of asthma patient self-management. The scale should receive further study to assess its value as a research tool, and as a way for health professionals to review their own education and counseling behavior.

References

1. *Guidelines for the Diagnosis and Management of Asthma* (National Asthma Education Program Expert Panel Report). Bethesda, MD, National Asthma Education Program, Office of Prevention, Education and Control, National Heart, Lung, and Blood Institute, August 1991. (NIH Pub. No. 91-3042.)
2. Becker MH: Patient adherence to prescribed therapies. *Med Care* 3:539-555, 1985.
3. Becker MH: Improving patient compliance to prescribed therapy. *Cardiol Rev Rep* 8:57-59, 1987.

4. Becker MH: Theoretical models of adherence and strategies for improving adherence, in Schumaker SA, Schron EG, Ockene JK (eds.): *Handbook of Health Behavior Change*. New York, Springer, 1990.

5. Clark NM, Nothwehr F, Gong M, Evans D, Maiman LA, Hurwitz ME, Roloff D, Mellins RB: Physician-patient partnership in managing chronic illness. *Acad Med* 70:957-959, 1995.

6. Inui TS, Yourtee EL, Williamson JW: Improved outcomes in hypertension after physician tutorials. *Ann Intern Med* 84:646-651, 1976.

7. Maiman LA, Becker MH, Kiptak GS, Nazarian LF, Rounds KA: Improving pediatricians' compliance-enhancing practices: A randomized trial. *Am J Dis Child* 142:773-779, 1988.

8. Bandura A: *Social Foundations of Thought and Action*. Englewood Cliffs, NJ, Prentice Hall, 1986.

9. Clark N, Zimmerman BJ: A social cognitive view of self-regulated learning about health. *Health Educ Res* 5:371-379, 1990.

10. Crain EF, Weiss KB, Bijur PE, Hersh M, Westbrook L, Stein RE: An estimate of the prevalence of asthma and wheezing among inner city children. *Pediatrics* 94:356-362, 1994.

11. Clark NM, Feldman CH, Evans D, Duzey O, Levison MJ, Wasilewski Y, Kaplan D, Rips J, Mellins RB: Managing better: Children, parents, and asthma. *Patient Educ Couns* 8:27-38, 1986.