Patient Compliance with Antihypertensive Medication

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Abstract: Self-reported medication taking compliance behavior of 132 high blood pressure patients was analyzed using an expanded version of the health belief model. Subjects were selected through random sampling procedures from regular hypertension program sessions at a large urban hospital. A questionnaire was constructed to measure the model components, and interviews were conducted with each patient. Bivariate analysis showed that control over health matters, dependence on providers, perceived barriers, duration of treatment, and others' nonconfirming experience were significantly related to compliance ($p < .05$). Log-linear multivariate analysis revealed that three of these five variables—control over health matters, perceived barriers, and duration of treatment—contributed independently to patient compliance. Self-reported medication taking was significantly related to blood pressure control ($p < .02$). These data provide the basis for developing interventions for providers to facilitate the medication taking behavior of clinic patients. (*Am J Public Health* 1980; 70:1081-1089.)

Introduction

Hypertension is a major health problem, with an estimated 35 million Americans having definite high blood pressure and an additional 25 million having borderline elevations.[1] Control of blood pressure can be accomplished through medication regimens, and this is known to improve morbidity and mortality even for borderline hypertensives.[2] Yet, many patients with hypertension do not comply with prescribed regimens.[3]

Many demographic and sociobehavioral features of patients, the disease, the therapeutic regimen and source, and the patient-provider relationship have been studied as determinants of compliance.[4] Two recent reports evaluating compliance with antihypertensive medications have included all of these factors.[5,6] Both were based on the health belief model.[7,8]

According to health belief theory, the probability that a person will take a preventive action is a function of the perceived susceptibility to the disease or diseases, the perceived severity of the disease or diseases, and the perceived benefits and barriers related to the recommended action. The model also recognizes that compliance may be influenced by the patients' motivations, patient-provider interactions, characteristics of the therapeutic source and regimen, age of the patient, and social interaction. Finally, one or more "cues to action" may be necessary to trigger the appropriate behavior.

In the present study, an approach similar to that taken by Nelson, et al,[6] is used to analyze compliance with antihypertensive medication. The major categories of variables include core perceptions of the patients, modifying factors, and certain cues to action which may be important for influencing the likelihood of complying.

This article describes the methodology and findings of the first phase of a long-term study designed to test ways of improving medication-taking compliance. The goal of this first phase is to identify factors which are associated with compliance. The baseline data will subsequently be utilized to develop and test educational approaches for improving the compliance of the same population.

Methodology

Study subjects were selected through random sampling from weekly hypertension program sessions at The Hospital of the University of Pennsylvania between October 1978 and April 1979. Subjects were already under care in the hypertension program, having been evaluated and diagnosed according to standard criteria.[9] All had been prescribed one or more antihypertensive medications. Patients attending regularly scheduled follow-up appointments with either a nurse practitioner or a nurse functioning in an expanded role were eligible. Patients were interviewed while waiting to be seen by their nurse providers.

Interviewers were paid health education students trained by the investigators.* Included in the training were

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*Interviewers included one Black and two White males and one Oriental, three Black, and three White females. No attempt was made to match patients and interviewers by race or sex.

instructions and several practice interviews to reduce bias and assure maximum uniformity among interviewers. After introducing him/herself as an agent for a research team, the interviewer explained the procedure and asked the patient to participate in the study. Each patient was assured of the confidentiality of his/her response. Of 137 patients asked, 133 agreed and were interviewed. One patient could not understand the questions and was therefore eliminated, resulting in a total sample of 132 patients. Interviews, conducted in a private conference room in close proximity to the waiting area, took 15–30 minutes. Every effort was made to assure each patient that his/her appointment would not be delayed because of the interview.

The sample consisted of 80 females and 46 males with an average age of 52 years; 121 of the 132 patients were Black. Fully 74 patients were not employed for most of the previous year. Over one-half of the total sample reported family incomes for 1977 of less than $5,000. Less than one-half were married.

Dependent Variable

During the interview, subjects were asked whether they took their high blood pressure pills "always, most of the time, some of the time, seldom, or never." Of the 132 subjects, 82 indicated they took their medication always, 45 indicated most of the time, and the remaining five said some of the time.

Following the interview, during the subject's regular clinic visit, the provider, who was aware of which patients were included in the study, asked each subject to estimate the number of pills he/she missed in an average week. Of the 82 subjects who had answered "always" during the initial interview, 17 indicated to their provider that they missed one or more pills in an average week. None of those answering "most of the time" or "some of the time" during the initial interview indicated subsequently that they missed no pills in an average week. For purposes of analysis, the 65 subjects who indicated "always" during the interview and also indicated during the clinic visit that they never missed taking pills in an average week were classified as "always comply." All other subjects (67) were classified as "not always comply." This dichotomous variable was used as the dependent variable for studying determinants of compliance.**

Independent Variables

Each independent variable of the model was operationalized by using single or multiple questionnaire items. The variables are listed below, and described in more detail in the Appendix; we indicate in parentheses after each variable the direction of our hypothesis concerning the relationship of the variable with compliance. In some cases, no hypothesis is stated since previous results are conflicting or show no relationship.

Core Perceptions

- Perceived susceptibility to more serious illnesses: Four items (positive)
- Perceived severity of more serious illnesses: Four items (positive)
- Perceived benefits: Two items (positive)
- Concern about health matters in general: One item (positive)
- Vulnerability to illness in general: Four items (positive)
- Control over health matters: Six items (positive)
- Dependence on Providers: Six items (positive)

General Modifying Factors

- Age (no hypothesis)
- Sex (no hypothesis)
- Education (no hypothesis)
- Current employment status (no hypothesis)
- Income (no hypothesis)

Specific Modifying Factors

- Perceived barriers: Six items (negative)
- Duration of condition: One item (negative)
- Duration of treatment: One item (negative)
- Satisfaction with providers, clinic: Two items (positive)

Cues to Action

- Others' nonconfirming experience: Six items (negative)
- Support given by providers: Two items (positive)
- Support given by family: One item (positive)

Many of these variables consist of multiple items. These items were initially grouped on the basis of face validity. However, in some cases, items were not found to be significantly correlated with any other item in the group. Therefore, the following procedure was used to form the final indices.

First, a reliability coefficient (alpha) was computed along with the intra-item correlation matrix using all of the items initially defining each variable.[10] Any item found to be correlated at the 0.20 level or lower with any other item in the group was dropped from the group and the new reliability coefficient was computed. In all cases, the reliability coefficient improved after dropping each such item. Next, an index score for each subject was calculated by summing each patient's response on each component of the index assuming equal weighting of items. Finally, the scores of these indices were themselves dichotomized. For indices with multiple items, individuals with missing data for any item were deleted for computing the index and for subsequent tests of association between the index and compliance.

Analysis

The data were analyzed by first determining which independent variable had a significant relationship ($p < .05$) with compliance, without controlling for the effects of other variables, using the χ^2 test. The next step was to determine

**The modal response to the pill-taking question during the regular clinic visit was "no pills missed."

TABLE 1—Relationship between Compliance and Blood Pressure Control

Compliance	N[a]	BP Controlled[b] %	χ^2	p Value[c]
Missed None	45/60	75		
Missed Some	34/64	53	6.41	.02
Missed None	45/60	75		
Missed More Than Three	5/18	28	13.42	.01

[a]Totals do not include patients from whom blood pressures were not available.
[b]Blood pressure is considered controlled if the diastolic pressure is ≤ 90 mm Hg for ages 20-39 years, ≤ 95 mm Hg for ages 40-59, and ≤ 100 mm Hg for 60 years and older.
[c]The *p* values are based on a two-tailed test.

which of these variables contributed independently to explaining compliance. To perform this step, log-linear multivariate analysis was chosen. This statistical method is valuable for measuring and testing the complex interactions which arise in multidimensional tables. It is similar to well-known procedures such as analysis of variance and regression analysis. However, it deals only with categories or groups of observations. In other words, the units of analysis are cell probabilities or functions of cell probabilities. For detailed discussion of log-linear multivariate analysis, see Bishop, Feinberg, and Holland[11] and Reynolds.[12] The BMDP Log-Linear Model (P3F) program for multi-way frequency tables was used to perform the analysis.[13]

The purpose of the analysis was to form a model which explained compliance, taking into account both one-factor and multiple-factor effects. The BMDP program was used both for screening various interactions to determine whether they were necessary in the model as well as to fit specified models. The program tests the appropriateness of models by the likelihood ratio $\chi^2(G^2)$ and by the usual χ^2 goodness-of-fit.

The procedure followed was similar to that taken by Nelson, et al.[6] First, the goodness-of-fit between observed and expected cell frequencies for a large reference model was determined as measured by the likelihood ratio statistic (G^2). This reference model was the model which included all one-factor effects and all two-factor interactions between the dependent variable (compliance) and each of the independent variables found to be significantly associated with compliance in the bivariate analysis. Next, the screening capabilities of the BMDP program were used to suggest more parsimonious models which could be formed by dropping terms from the reference model. The goodness-of-fit of each new model was compared with that of the reference model; a small difference indicated that the term dropped did not substantially contribute to explaining compliance. The entire procedure was then repeated for successively smaller reference models.

Results

Relationship of Compliance with Blood Pressure Control

As shown in Table 1, there was a positive relationship between compliance and blood pressure control. Seventy-five per cent of those reporting they always comply and 53 per cent of those reporting they do not always comply had controlled blood pressure (difference = 22 per cent, $p < .02$). The subset of patients who missed more than three pills in an average week were far less likely to have controlled blood pressure than those who missed none (difference = 47 per cent, $p < .01$).

Relationship of Each Variable with Compliance

Table 2 shows the results of bivariate analysis of each independent variable and compliance. The number of items ultimately used for each variable is indicated and, for each variable that was formed from multiple items, the reliability index is given. The per cent complying for each category of the independent variables is indicated, along with the percentage difference, the χ^2 value, and an indication of significance for each variable.

Significance is noted in Table 2 and in the succeeding discussion by indicating those relationships for which the p value was less than .05 using a one-tailed test. A one-tailed test is only appropriate when testing variables for which hypotheses are advanced about the direction of relationship with compliance. This was the case with each variable shown to be significantly related to compliance, and the results were all in the expected direction. None of the general modifying factors (for which no hypotheses were advanced) was significantly related to compliance, even at the .10 level using a two-tailed test.

Among the seven variables used to measure core perceptions, only control over health matters and dependence on providers were significantly related to compliance, both in the expected direction. Of the other five variables, three (perceived severity, perceived benefits, and concern about health matters) exhibited trends in the expected direction while two (perceived susceptibility and vulnerability to illness in general) did not.***

None of the five general modifying factors was significantly related to compliance. This is consistent with the find-

***Because the reliability coefficient for the perceived benefits index was relatively small (.473), we also examined the relationship of compliance to each of the two items comprising this index. In each case the relationship was even weaker than that shown for the index.

ings of other compliance studies which have analyzed these demographic variables.[4]

Two of the four modifying factors specific to hypertension—perceived barriers and duration of treatment—were significantly related to compliance in the expected direction. The index for perceived barriers was ultimately created from four items. Subjects were asked to indicate how much each of the following things created a problem for them:

1. Sometimes I worry that taking high blood pressure medicine can cause health problems.
2. Taking my high blood pressure medicine disrupts my daily schedule and makes it difficult to get things done during the day.
3. I don't like the side effects of the high blood pressure medicine.
4. I don't like the taste of the high blood pressure medicine.

Not only was the index of perceived barriers significantly related to compliance but each one of these four items was also significantly related to compliance in the expected direction.‡

Of the three specific cues to action, only others' nonconfirming experience was related to compliance. Knowledge of others with experiences which did not confirm continued compliance apparently had a negative influence on subjects' compliance. The index formed to measure support given by providers yielded the expected relationship, although not significant.‡‡ Surprisingly, the results for family support were in the opposite direction from that hypothesized, although nonsignificant.

Results of Multivariate Analysis

The bivariate analysis showed that five independent variables were significantly associated with patient compliance. The next step was to determine which of these variables contributed independently to explaining compliance, using log-linear multivariate analysis as described above.

The analysis revealed that just three of the five variables contribute independently to patient compliance—control over health matters, perceived barriers, and duration of treatment. The final model is shown in Table 3. The model has a very good goodness-of-fit (likelihood ratio $\chi^2 = 4.50, p = .81$). The model would predict that as high as 74 per cent

‡Two other items asked about the difficulty of obtaining the medicine and its cost. These items were dropped from the final index of barriers because of low correlations with the remaining four items. Separate analysis showed that neither of these two items was significantly related to compliance.

‡‡Because of the relatively low reliability coefficient (.480), we also examined the relationship of compliance to each of the two items comprising the index. In each case, the relationship was even weaker than that shown for the index.

TABLE 2—Independent Variables, Reliability Coefficients, and Relationships with Compliance

Independent Variable	Reliability Coefficient	Percentage Always Taking Medication %	N	χ^2
Core Perceptions				
1. Perceived Susceptibility (3 items)	.810			
High		46.6	73	
Low		50.0	54	
Difference		− 3.4		.15
2. Perceived Severity (3 items)	.729			
High		48.8	80	
Low		45.7	46	
Difference		+ 3.1		.11
3. Perceived Benefits (2 items)	.473			
High		55.0	60	
Low		45.0	60	
Difference		10.0		1.20
4. Concern about Health Matters in General	item			
High		53.3	75	
Low		43.9	57	
Difference		9.4		1.16
5. Vulnerability to Illness in General (3 items)	.597			
High		42.3	52	
Low		52.6	76	
Difference		−10.3		1.32
6. Control over Health Matters (4 items)	.749			
High		57.4	68	
Low		41.3	63	
Difference		+16.1		3.38*
7. Dependence on Providers (5 items)	.824			
High		58.3	60	
Low		42.6	68	
Difference		+15.7		3.14*

(continued)

TABLE 2—Independent Variables, Reliability Coefficients, and Relationships with Compliance *(continued)*

Independent Variable	Reliability Coefficient	Percentage Always Taking Medication %	N	χ^2
Modifying Factors: General				
8. Age	item			
> 50		53.5	71	
≤ 50		44.3	61	
Difference		+ 9.2		1.13
9. Sex	item			
Male		52.2	46	
Female		47.7	86	
Difference		+ 4.5		.24
10. Education	item			
High (completed high school)		52.2	90	
Low (did not complete high school)		41.5	41	
Difference		+10.7		1.30
11. Current Employment Status	item			
Employed full-time		43.1	58	
Not employed full-time		54.1	74	
Difference		−11.0		1.56
12. Income	item			
High (≥ $7,000)		52.9	51	
Low (< $7,000)		46.0	63	
Difference		+ 6.9		.54
Modifying Factors: Specific to Hypertension				
13. Perceived Barriers (4 items)	.621			
High		41.1	73	
Low		60.0	55	
Difference		+18.9		4.49*
14. Duration of Condition	item			
Long (≥ 5 years)		42.6	68	
Short (< 5 years)		53.4	58	
Difference		−10.8		1.46
15. Duration of Treatment	item			
Long (≥ 5 years)		40.0	65	
Short (< 5 years)		56.3	64	
Difference		−16.3		3.41*
16. Satisfaction with Providers and Clinic (2 items)	.763			
High		51.9	108	
Low		40.9	22	
Difference		+11.0		.88
Cues to Action				
17. Others' Nonconfirming Experience	item†			
Yes		39.1	46	
No		55.3	85	
Difference		−16.2		3.12*
18. Support Given by Providers (2 items)	.480			
High		52.4	82	
Low		44.2	43	
Difference		+ 8.2		.77
19. Support Given by Family	item			
High		45.5	55	
Low		51.9	77	
Difference		− 6.4		.58

*Relationship is significant at the .05 level (one-tailed test).
†This item was formed from six branching questions.

TABLE 3—Percentage Always Taking Medication as a Function of Three Predictors

Control over Health Matters	Perceived Barriers	Duration of Treatment	Predicted Percentage Always Taking Medication %	Observed Percentage Always Taking Medication %	Total in Row
High	High	Long	40	39	18
High	High	Short	58	65	17
High	Low	Long	58	64	11
High	Low	Short	74	61	18
Low	High	Long	26	24	21
Low	High	Short	42	41	17
Low	Low	Long	42	46	13
Low	Low	Short	59	67	9
				Table Total =	124
				Missing Data =	8
				Total Sample =	132

Likelihood Ratio χ^2 : 4.50
Degrees of Freedom : 8
p : .81

Conditional Odds Ratios
Control over Health Matters : 1.9
Perceived Barriers : 2.0
Duration of Treatment : 2.0

of those classified as having high perceived control over health matters, low barriers, and short duration of treatment would always take their medication. Only 26 per cent of those with the opposite values for these variables would always comply.

It is not surprising that the variables measuring dependence on providers and others' nonconfirming experience are not needed, since separate analysis showed that the pairwise correlations of these two variables with control over health matters are high.‡‡‡ Reflection on this result led us to hypothesize that those with high perceived control over health matters would be more likely to have their behavior influenced by others' nonconfirming experience and that those who did not have high dependence on providers would similarly be more likely influenced. Table 4 supports these hypotheses. Those who feel they have relatively more personal control over maintaining health and avoiding illness are influenced by the experiences of others in using the medication; those who perceive less control are not so influenced. Similarly, those subjects who place relatively high reliance on their providers are not influenced by others' experiences; subjects who place relatively low reliance on their providers are so influenced.

One final set of analyses was performed to determine if perceived susceptibility and perceived severity might interact to affect compliance. This analysis was motivated by the extensive literature showing strong relationships between compliance and these beliefs.[7] Contingency tables were created to test whether either of the two beliefs served as a control variable for "explicating" a relationship between the other belief and compliance.[12] No significant relationships were found.

Discussion

The association between compliance and blood pressure control in this study was similar to that reported in previous work. Nelson, et al,[6] reported a statistically significant relationship between self-reported compliance and blood pressure control (difference = 25 per cent, $p < .02$). Levine, et al,[14] reported ". . . adequate predictive validity with blood pressure levels." In the present study, there was a significant positive relationship between blood pressure control and compliance when compliance was dichotomized between missing no pills and missing some pills (difference = 22 per cent, $p < .02$). The relationship was even stronger when comparing those who missed no pills with those missing three or more pills (difference = 47 per cent, $p < .01$).

There are several possible explanations as to why these relationships were not even stronger. One explanation has to do with the relationship between stated and actual behavior. Self-reporting, or measurement through interview, must be interpreted with caution. In an extensive review of this issue, Gordis[15] points out that compliers have no reason to report noncompliance, but that some noncompliers will not respond truthfully. In the present study, most noncompliers were probably identified since patients were classified as missing no pills only if they indicated this in both the initial interview and the subsequent clinic visit. Seventeen individuals were sufficiently comfortable in their provider relationship to admit to noncompliance even though they had stated during the initial interview that they always took their medication.

Other explanations have to do with the relationship between actual behavior and blood pressure. There may have

‡‡‡The complete correlation matrix is available from the authors upon request.

TABLE 4—Relationships of Others' Nonconfirming Experience with Compliance, Controlled for Control over Health Matters and Dependence on Providers

Independent Variable	Control Variable	Percentage Always Taking Medicine %	N	χ^2
Others' Nonconfirming Experience	Control over Health Matters			
Yes	High	36.8	19	
No	High	65.3	49	
Difference		−28.5		4.57*
Yes	Low	40.7	27	
No	Low	41.7	36	
Difference		− 1.0		.01
Others' Nonconfirming Experience	Dependence on Providers			
Yes	High	61.5	13	
No	High	58.7	46	
Difference		− 2.8		.03
Yes	Low	30.3	33	
No	Low	51.3	39	
Difference		−21.0		3.24*

*Relationship is significant at the .05 level (one-tailed test).

been patients in the sample who took their medicine regularly but were not controlled because the medical regimen was not effective or because of the effects of diet or other factors influencing blood pressure. Furthermore, some patients who reported noncompliance may have found that they can miss some pills and still maintain control of their blood pressure.

Three variables contributed independently to explaining self-reported medication taking compliance. These included one core perception (control over health matters) and two modifying factors (perceived barriers and duration of treatment). In addition one core perception (dependence on providers) and one cue to action (others' nonconfirming experience) were related to compliance, although they were correlated with control over health matters.

Barriers such as side effects and complexity have often been reported to be negatively related to compliance. (See Haynes[4] for a review of this literature.) Nelson, et al,[6] found a significant relationship between side effects and compliance with high blood pressure medication. Kirscht and Rosenstock[5] found this same relationship, as well as a significant relationship between difficulty in following the doctor's advice and medication compliance. Levine, et al,[14] reported that patients had difficulty incorporating their drug regimen into their daily schedule. The variety of barriers related to compliance in the present study suggests an unusually strong relationship in this subject group.

The literature on duration of treatment is less consistent. In a recent review of this literature, Christensen[16] found that there is a negative association between compliance and length of treatment in studies of diseases other than high blood pressure. Haynes's[4] review of the literature suggests a more cautious conclusion, particularly for patients in ongoing treatment programs. It remains to be determined whether decreasing compliance over time is unique to this subject group, or whether it applies to high blood pressure patients in general. It could also be that people who have been in treatment for a long time are more willing to admit noncompliance than others.

The finding that control over health matters was significantly related to compliance supports the finding of Kirscht and Rosenstock,[5] and is consistent with the emerging description of health locus of control relationships (Wallston and Wallston[17]. The construct of locus of control is deeply rooted in social learning theory which attempts to integrate reinforcement theories and field theories. According to Rotter,[18] locus of control tells something about the general expectancies of individuals. It is a personality variable that can be expected to be a relatively consistent characteristic of a person that should help to predict how reinforcement changes expectancies. According to the health belief model, control over health matters is a core perception which refers to the patient's general belief about the relationship between his/her health actions and consequent reinforcement. Kirscht[19] distinguished between expectancy for control and motivation for control in examining preventive health beliefs and behavior. This type of research shows promise for uncovering the relationships among the core perceptions of the health belief model.

Although control over health matters was predictive of compliance, other core perceptions such as perceived susceptibility, perceived severity, and perceived benefits were not. Previous studies have found a significant relationship

between these other core perceptions and compliance.[7] There are several possible explanations for this discrepancy. First, it is possible that we did not get accurate information about the core perceptions of the study group. However, the interviewing procedures employed were standard and adequate, great care was taken in wording the questions to obtain accurate information about patients' beliefs while controlling for their current medication taking behavior, and there was excellent internal consistency of individual responses to questions within variable categories. Second, it may well be that these other core perceptions simply do not predict compliance of many high blood pressure patients.

Others' nonconfirming experiences interacted with high perceived control over health matters to reduce compliance in this study group. Knowledge of others with nonconfirming experiences had more impact on the compliance behavior of individuals classified as having high perceived control over health matters than on the behavior of those classified as having low perceived control. According to Rotter,[18] generalized expectancy goes up as the situation is more novel or ambiguous and goes down as the individual's experiences with the situation increase. In terms of the health belief model, others' nonconfirming experiences are negative external cues to action.

Dependence on providers was also not independently predictive of compliance due to its high correlation with control over health matters. However, the result of the bivariate analysis showing a positive relationship between compliance and dependence on physicians was opposite from Kirscht and Rosenstock.[5] Nevertheless, other researchers have noted the importance of the physician-patient relationship.[20, 21] Since the literature is conflicting and since the providers in our study were nurses, generalizations are difficult.

Since this study had a retrospective design, it cannot be determined that the attitudes and beliefs which are related to compliance existed prior to the compliance behavior. Neither can it be established that changes in attitudes and beliefs will necessarily lead to changes in behavior. Therefore, the next phase of the study will be to use clinical trials to test the utility of educational interventions suggested by the empirical results reported in this article.[14, 22–27]

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APPENDIX

Core Perceptions

1. *Perceived Susceptibility to More Serious Illnesses:* Four items were included on the subject's perception of susceptibility to more serious illnesses as a result of high blood pressure if he/she never took the medicine. One item asked about a more serious illness in general; the other three asked about heart attack, stroke, and kidney failure.

2 *Perceived Severity of More Serious Illnesses:* Four items were included on the subject's perception of severity of more serious illnesses as a result of high blood pressure if he/she never took the medicine. One item asked about a more serious illness in general; the other three asked about heart attack, stroke, and kidney failure.

3. *Perceived Benefits:* Two items were included on the subject's perception of the efficacy of the medicine for improving health and the usefulness of the medicine compared to other medicines available for serious illnesses.

4. *Concern about Health Matters in General:* One item was included on how much subject worries about his/her health.

5. *Vulnerability to Illness in General:* Four items were included on subject's perception of his/her health and how easily he/she gets sick.

6. *Control over Health Matters:* Six items were used to assess whether health was perceived to be under the control of the individual (high) or due primarily to external forces such as fate, luck, or chance (low).

7. *Dependence on Providers:* Six items were used to determine the extent to which the subjects relied on and trusted their medical professionals' advice.

Modifying Factors: General

8. *Age:* One item
9. *Sex:* One item
10. *Education:* One item
11. *Current Employment Status:* One item
12. *Income:* One item

Modifying Factors: Specific to Hypertension

13. *Perceived Barriers:* Six items were included to determine how much the subject worries that the medicine can cause health problems, whether taking the medicine disrupts the daily schedule, whether the medicine is hard to obtain or too expensive, and whether the side effects or the taste of the medicine present a problem.

14. *Duration of Condition:* One item was included on how long subject had had high blood pressure.

15. *Duration of Treatment:* One item was included on when medicine was first prescribed for high blood pressure.

16. *Satisfaction with Providers and Clinic:* Two items were included on satisfaction with care and perceived thoroughness of providers.

Cues to Action

17. *Others' Nonconfirming Experience:* Six branching items were used to determine if the subject either knew someone with high blood pressure who had a more serious illness because of high blood pressure even though this person took medicine regularly, or if the subject knew someone with high blood pressure who did not take medicine regularly and who had not had a more serious illness because of high blood pressure. If the subject knew someone in either or both categories, he/she was classified as knowing others with a nonconfirming experience.

18. *Support Given by Providers:* Two items were included on how much the subject perceived that providers cared whether the subject took the medicine and how often the providers offered helpful suggestions.

19. *Support Given by Family:* One item was included on whether someone at home reminded the subject to take the medicine.

Cancer Rehabilitation Forum to be held Nov. 13-15

A "National Forum on Comprehensive Cancer Rehabilitation and its Vocational Implications," will be held in Williamsburg, Virginia, November 13-15, 1980, at the Fort Magruder Inn and Conference Center. Goals of the conference are to review topics pertinent to comprehensive rehabilitation of the individual with cancer, introduce current rehabilitation models, determine applicability of models to specific organizational situations, identify policy limitations and attitudinal constraints affecting vocational rehabilitation, and generate ideas for new, more effective methods.

Five topic areas to be addressed include: Medical Update, Legislative Mandates, Psycho-Social Issues, Training Models, and Employment. The forum provides an opportunity for a multidisciplinary discussion of information, issues and problems in cancer-related disabilities and rehabilitation, with special emphasis on conditions which influence employability, such as: advances in medical treatment, psycho-social effects of catastrophic illness, assessment of vocational potential, and barriers to employment.

Limited to 175 participants, with a balance among disciplines represented, the fee for the two and one-half day forum is $175. Continuing education/continuing medical education units are available. Co-sponsors of the forum are the Virginia Department of Rehabilitative Services, the Department of Continuing Medical Education and the Cancer Rehabilitation Program of the Medical College of Virginia, Virginia Commonwealth University.

For further information, contact Kathy E. Johnson, Conference Coordinator, Dept. of Continuing Medical Education, MCV/VCU, MCV Station, Richmond, VA 23298.