The Association Between Marital Adjustment And Compliance With Antihypertension Regimens

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***Abstract*: The purpose of this cross-sectional survey was to determine relations between marital adjustment as measured by the Dyadic Adjustment Scale and antihypertension compliance. From seven dependent measures, we found high marital adjustment scores to be significantly correlated with less obesity, lower frequency of forgetting blood pressure medications, and less cessation of blood pressure medicine. These effects were much larger in a younger subsample of respondents who were 28 to 50 years old. The Dyadic Adjustment Scale measures the respondent's perception of the degree of affection and consensus, cohesion, and satisfaction in marriage. We conclude that the perception of positive marital interaction and communication ultimately contributes to controlled blood pressure by helping the patient to maintain healthy weight and to remember and continue taking blood pressure medication. (J Am Bd Fam Pract 1990; 3:17-25.)**

Noncompliance with treatment regimens is a major problem in medicine, particularly for conditions such as hypertension, where symptoms are not readily evident to the patient.[1] National studies indicate that approximately half of all patients treated for hypertension discontinue their therapy within 1 year.[2] In addition, less than half of those who remain in treatment comply with recommendations sufficiently to achieve long-term control of their blood pressure. In 1980, less than 35 percent of patients treated for hypertension had their blood pressure controlled.[2] Social support has been identified as one important variable that influences compliance behavior. A number of cross-sectional studies have found general family support to be related to increased compliance with medical regimens of various types.[3-5] Studies have also linked the supportive functions of marriage to health in general.[6-8]

Studies of Marital Functioning and Hypertension Compliance

Relatively few studies have focused on the effect marriage and marital functioning have on hypertension compliance. Earp and Ory compared five groups on compliance with blood pressure monitoring.[9] One group was monitored primarily by spouse or significant other, and the other groups were monitored by self or others. At the end of 2 years, only the spouse- or significant-other–monitored group maintained lowered blood pressure. Caplan, et al. assigned 483 patients to one of two groups, those supported by a partner and those with other social supports, to compare medication adherence, lowered blood pressure, and remaining in treatment.[10] Both groups had similar improvements on the first two measures, but the spouse or partner group remained in treatment longer. Green, et al. conducted a factorial design experiment to improve compliance with blood pressure regimens.[11] Interventions included an exit interview at a clinic to reinforce understanding of the treatment, a one-time home visit to encourage supportive behaviors from the family member with whom the patient most frequently interacted (most of these were spouses), and a support group meeting. Patients were assigned to groups receiving one of each approach or to all combinations. The family member-spouse support intervention was the most effective in increasing compliance with medications and appointment keeping. Greatest improvement in blood pressure control occurred in the group receiving all three strategies.

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Similarity of Blood Pressure Measurements in Spouses

The specific factors in marriage that relate positively and negatively to hypertension and compliance with high blood pressure treatment regimens are beginning to be studied. In a large community survey, Speers studied the similarity between blood pressures in spouses when neither one of the couple was receiving antihypertension medication.[12] She found a significant correlation in normotensive and hypertensive blood pressure measurements between spouses, even when controlling for similarity of health habits and the presence of other risk factors. Similar blood pressure values between spouses obviously are not due to shared genetic backgrounds but are due to other factors in the shared marital environment. Speers concluded that the concordance can be due to certain interactional factors between the spouses, such as communication patterns, especially those involving the handling of conflict and emotions.[12] This idea has been indirectly supported in a study of factors related to successful maintenance of weight loss in married women. Fischman-Havstad found that women whose husbands were excessively critical, hostile, and openly emotionally reactive to the wife significantly relapsed in their weight control.[13]

Marital Dissatisfaction and Hypertension

Recent research indicates conflict and difficulty with communication can be related to high blood pressure. Lynch studied the effect on blood pressure of 2-minute conversations about neutral topics in 30 patients with essential hypertension and 15 normotensives.[14] During conversations, there was a significant rise in mean arterial pressures from baseline in the hypertensives but not in the controls. Similarly, in a study of 20 hypertensive patients, Melville found that blood pressure was elevated 26 percent above baseline during the introduction of emotionally stressing themes.[15]

A few studies have investigated specifically the relations among marital adjustment, blood pressure levels, and treatment of hypertension. Hafner, et al. compared the marital adjustment of 57 patients with essential hypertension and their spouses with that of a matched sample of normotensive married couples.[16] They used the Marital Attitudes Evaluation questionnaire to measure five marital interactions, such as giving affection. They found a significant difference between hypertensive men and their spouses and hypertensive women and their spouses. In hypertensive men, there was an abnormal degree of reciprocally perceived dissatisfaction between spouses, with the spouses of the men showing raised levels of dissatisfaction. That is, both members of the couple agreed significantly that there was dissatisfaction, but the wives were even more dissatisfied. Among the men hypertensives, the men who felt the most dissatisfied with their wives' confidence, trust, and belief in them were married to women who were most dissatisfied with the amount of affection, warmth, attention, and interest they received from their husbands. Among the women hypertensives, there was a significant lack of agreement between spouses about the presence of dissatisfaction. Very high levels of satisfaction in one partner were associated with low levels in the other. This was taken to indicate a lack of acknowledgement of differences, which may itself have an effect on hypertension in women.[16]

Two case studies also implicate marital adjustment in the maintenance and treatment of high blood pressure. Ewart and colleagues studied the effect of conjoint marital counseling on marital interaction and blood pressure in two men with essential hypertension.[17] Before treatment, blood pressure rose 50 percent above baseline during intense marital conflict. After counseling, both marital conflict and blood pressure were significantly reduced. Ewart also found that the partners of each couple disagreed on self-report questionnaires about the presence of conflict. Thus, unacknowledged conflict was again implicated.[17] In a single-case, repeated measures design, Summers reported on a woman with severe essential hypertension.[18] The patient's blood pressure remained extremely high for the 2 years prior to conjoint marital therapy despite a wide range of antihypertensive medications. Her blood pressure fell by more than 30 percent from baseline after marital therapy, which suggests that, at least with this patient, marital interactions were important in both the maintenance of high blood pressure and its treatment.[18]

Summary of Previous Research

There is evidence that marital interaction and satisfaction are related to high blood pressure and

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to its treatment in some patients. The samples in these studies have been small-to-medium sized, and there has been no systematic study of the effect of marital adjustment on a range of behaviors related to compliance with hypertension regimens. The purpose of this study was to determine the association of perceived marital function with compliance with antihypertensive regimens. Specifically, we hypothesized that higher scores on the Dyadic Adjustment Scale,[19] a measure of marital function, would be associated with better medication compliance, weight control, smoking cessation, moderate use of alcohol, greater physical activity, and lower diastolic blood pressure.

Methods

Selection of Patients

Patients were from a family practice center at a Southwest medical university. Those who were included in the study had been diagnosed as having essential hypertension, were married, and had been followed for hypertension for at least 6 months while having been active patients of the center for at least the previous 18 months. Inclusion criteria also required that patients be minimally 21 years old and not be more than 65 years old when the study reached its conclusion after 2 years. Patients were excluded if they were found to have a terminal disease or serious mental illness. An extensive medical record audit showed 882 active patients with hypertension. From the medical charts and from self-reports, we identified 200 married patients who met the inclusion criteria.

The Survey Instrument and Procedures

There were three mailings of the questionnaire packet spaced approximately 1 month apart. A reminder postcard was mailed to each person after the first two mailings. The packets contained a personalized letter from the investigators describing the study and encouraging participation, the questionnaire, a business return envelope, a medication card with instructions, and, in the last mailing, a note in Spanish to potential Spanish-speaking patients.

The survey instrument consisted of three parts. The first portion was designed by the investigators to measure compliance with an antihypertensive regimen. Patients were asked the names of their current antihypertensive medications, the dosage and frequency used, how often they forgot their medications, and whether they had stopped their medications for several days, weeks, or more during the previous years. Other questions pertained to how frequently they had seen their physician during the previous year, their weight, and attempts at dietary restrictions.

The second portion of the questionnaire consisted of questions from the Health Risk Appraisal, version 2.1A, an instrument developed and distributed by the Centers for Disease Control, that was designed to measure health risks associated with tobacco and alcohol use, obesity, physical inactivity, diabetes, hypertension, cancer, suicide, and homicide. Other questions were designed to measure perceived health status, life satisfaction, and social support from family and friends.

The third portion of the survey questionnaire consisted of the 32-item Dyadic Adjustment Scale. This scale was designed to obtain a total score on the 32-item scale and to measure each of the four components of dyadic adjustment: dyadic consensus, dyadic cohesion, dyadic satisfaction, and affectional expression. Reliability of the scale, estimated by its author using Cronbach's alpha-coefficient to measure internal consistency, was $r = 0.93$ for the total scale in a sample of 312 ($P < 0.001$). Reliability estimates for the subscales were: affectional expression, $r = 0.73$; dyadic cohesion, $r = 0.86$; dyadic consensus, $r = 0.90$; and dyadic satisfaction, $r = 0.94$. Content, criterion, and construct validity of the scale were evaluated by the authors and found to be quite satisfactory.[19] The Dyadic Adjustment Scale is a well-recognized instrument that has been used in numerous studies with varied populations and problems.[20-23]

Clinical Data Collection

Measures of diastolic blood pressure were calculated by computing the mean of the three most recent diastolic blood pressure readings recorded in the patient's medical record. Measures of height and weight were also from the medical records. An index of obesity was calculated by computing the percentage above recommended weight for height of each patient, based on the Metropolitan Life Insurance tables of recommended weight for height for medium-frame

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men and women. The remainder of the data on compliance with antihypertension regimens and the measures of dyadic adjustment were by participant self-report.

Results

Demographic Data

Questionnaires were completed and returned by 109 of the 200 married hypertensive patients contacted, yielding a 54.5 percent response rate. Table 1 describes the demographic characteristics of the respondents, as well as the mean score on the Dyadic Adjustment Scale. The mean age was approximately 50 years. There were more whites (65.1 percent) than blacks (34.9 percent). It should be noted that there were very few black men (n = 8). The majority of respondents were high-school graduates or above; however, 22 percent had less than a high-school education. The greatest proportion of respondents were in the $15,000 to $40,000 income range, but 28.4 percent had family incomes below $15,000 and 22.9 percent above $40,000. Table 2 summarizes the mean scores on the Dyadic Adjustment Scale by gender. National studies have repeatedly indicated that men generally report more satisfaction in marriage than women. We found a similar trend; men had a higher mean adjustment score (111) than women (102).

Table 1. Description of Patient Distribution on Independent Variables (n = 109).

Independent Variables	
Dyadic adjustment score (mean)	106
Age (mean)	50.5 years
Race (percent)	
White	65.1
Black	34.9
Education (percent)	
< High school	22.0
High school graduate	30.3
Some college	25.7
College graduate	22.0
Family income (percent)	
< $10,000	12.8
$10,000–$14,999	15.6
$15,000–$24,999	22.0
$25,000–$39,999	26.6
> $40,000	22.9

Table 2. Dyadic Adjustment Score by Gender.

	Men (n = 46)	Women (n = 63)
Dyadic adjustment score (mean)	111	102

Responses by Gender

Table 3 shows patient responses on all dependent variables by gender. For these descriptive purposes, the continuous measures of blood pressure and weight were converted to categorical measures to determine the proportion of the sample that was obese and the proportion who had uncontrolled blood pressure. A slightly greater percentage of women than men had out-of-control blood pressure, defined as a diastolic reading of greater than 90 mmHg when averaged from three readings. Considerably more women (70 percent) than men (41 percent) were obese when obesity was defined as 20 percent or more above recommended weight for height. Considerably more men (82.6 percent) than women (69.3 percent) reported almost never forgetting to take their blood pressure medications. However, approximately the same proportion of each group forgot them twice a week or more often (13 to 14 percent). One-fifth of both men and women reported stopping their medications for several weeks at a time. The great majority of women (83 percent) said they did not drink alcohol. Of the men, 15.2 percent said they were heavy alcohol drinkers while only 1.7 percent of women reported such. Heavy drinking was defined as greater than 15 drinks of beer, wine, or mixed drinks per week. More men exercised regularly than did women; however, the larger percentage of both groups reported little or no regular exercise. Sample size for those who "ever smoked regularly" was small (n = 59). Of these, 68.4 percent of the men and 66.7 percent of the women had stopped smoking.

Multiple Regression Analyses

Partial correlation coefficients from multiple regression analysis were used to test the hypothesis that higher dyadic adjustment scores (marital adjustment) would be associated with greater compliance with antihypertensive regimens and, conversely, that lower marital function scores would

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Table 3. Description of Patient Distribution on Dependent Variables by Gender (n = 109).

Dependent Variables	Percent Men (n = 46)	Percent Women (n = 63)
Obesity > 20 percent	41.3	69.8
Forget medications		
Never/seldom	82.6	69.3
Once a week	4.3	16.1
Twice a week or more	13.0	14.5
Stop medications	21.7	20.6
Alcohol		
None (< 1 drink/week)	45.7	85.0
Light (1–14 drinks/week)	39.1	13.3
Heavy (> 15 drinks/week)	15.2	1.7
Regular exercise	37.0	33.3
Diastolic blood pressure > 90 mmHg	21.7	27.0
Ever smoked regularly	(n = 38)	(n = 21)
Stopped smoking	68.4	66.7

be associated with less compliance. The dependent or response variables in the model were each of the seven antihypertensive compliance variables: obesity, frequency of forgetting to take medications, stopping prescribed medications, smoking cessation, amount of alcohol use, diastolic blood pressure, and physical activity. The independent or test variable in the model was each patient's total score on the Dyadic Adjustment Scale. Only the partial correlation coefficients from the regression analyses are reported. The partial correlation coefficients that demonstrate the association between the total scores on dyadic adjustment and each of the compliance measures, adjusting for age, gender, race, and education, are shown in Table 4. The correlation coefficients for each of the demographic variables with the compliance variables are also shown in order to report on the role of each of these demographic variables in the model.

The results of the analyses support our hypotheses for the first three compliance measures. As predicted, there is an inverse relation between the continuous measure of dyadic adjustment and the continuous measure of obesity. That is, higher marital adjustment is associated with lower percentages of obesity ($P < 0.05$).

Other Scales and Data

The ordinal scale for measuring frequency of forgetting medications was constructed so that 1 equaled never forgetting, 2 equaled forgetting once a week, and 3 equaled forgetting more than twice a week. Table 4 shows an inverse association between dyadic adjustment scores and frequency of forgetting antihypertensive medications; e.g., marital adjustment was significantly higher among those patients who reported they seldom or never forgot their medications than among those who forgot their medications twice a week or more often ($P < 0.01$).

On the dichotomous variable used to determine if respondents had stopped medications during the previous year, never stopping was coded 1 and stopping for several days or weeks in the past year was coded 2. As predicted, there was an inverse relation between adjustment and stopping medications. Significantly higher dy-

Table 4. The Association between the Dyadic Adjustment Scores and Antihypertension Compliance Measures Adjusted for Age, Gender, Race, and Education (Partial Correlation Coefficients).

Dependent Compliance Variables	Independent Variables				
	Dyadic Adjustment	Age	Women	Black	Education
Obesity	−0.18*	−0.13	0.23*	−0.04	−0.04
Forgetting medications	−0.24*	−0.24*	0.07	0.03	0.06
Stopping medications	−0.26†	0.05	0.06	0.01	0.02
Stopped smoking	0.04	0.23†	0.11	−0.26†	0.23†
Amount of alcohol	0.05	0.14	−0.35†	−0.11	0.13
Regular exercise	−0.09	0.12	−0.05	−0.08	−0.04
Diastolic blood pressure	0.11	−0.22*	−0.07	−0.02	0.01

*P < 0.05. †P < 0.01.

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Table 5. The Association between the Dyadic Adjustment Scores and Antihypertension Compliance Measures within the Group Aged 27 to 50 Years (Partial Correlation Coefficients).

Dependent Compliance Variables	Independent Variables			
	Dyadic Adjustment	Women	Black	Education
Obesity	−0.29*	0.02	−0.10	0.08
Forgetting medications	−0.42†	−0.11	0.31*	0.07
Stopping medications	−0.39†	−0.20	0.18	0.10
Stopped smoking	−0.07	0.09	−0.28	0.39*
Amount of alcohol	0.09	0.34	−0.04	0.20
Regular exercise	0.04	0.11	−0.15	0.14
Diastolic blood pressure	0.10	−0.04	−0.06	0.07

*$P < 0.05$. †$P < 0.01$

adic adjustment scores were reported among those who had continued their antihypertensive medications without interruption when adjusted for the demographic variables ($P < 0.01$).

The questionnaire collected data on whether respondents were currently smokers, never smoked, or had stopped smoking. The category of stopping smoking was used as a hypertension compliance measure that may be related to marital adjustment. The stopped smoking variable is a proportion of those who had ever smoked (current smokers and those who had stopped). The hypothesized relation between higher dyadic adjustment scores and stopping smoking was not supported by the data (Table 4). However, those who were older and higher educated were more likely to have stopped smoking.

Alcohol use was converted into an ordinal scale where 1 equaled no or little use, 2 equaled light-to-moderate use, and 3 equaled excessive use. Differences in amount of alcohol used per week were not associated with dyadic adjustment scores. Only gender differences were noted, with women drinking significantly less than men. A dichotomous measure of little or no exercise versus regular exercise was constructed. There were no significant differences in physical activity on the basis of dyadic adjustment scores.

Dyadic adjustment scores were not significantly associated with differences in diastolic blood pressure when measured as a continuous variable. Age was the only variable significantly associated with these differences, with younger persons somewhat more likely to have higher diastolic blood pressures ($P < 0.20$).

Age Group Differences

Because age was related to diastolic blood pressure and to several of the other dependent variables, the sample was divided at the mean into two groups: a younger group aged 27 to 50 years and an older group aged 51 to 63 years. All regression analyses were repeated within each age group. In general, the younger group was less compliant and had less well-controlled blood pressure. Controlled blood pressure was defined as below 90 mmHg diastolic when averaged on three occasions. Logically, if marital adjustment were to have a significant effect, it should be greater in the younger age group because they were more out of control. Table 5 summarizes these findings. Indeed, the previously significant relations between higher marital adjustment and better compliance, i.e., less obesity, forgetting blood pressure medications less often, and stopping prescribed medications less frequently, remained, and the strength of each relation increased greatly. In the older age group (Table 6) there was only one statistically significant relation. Higher marital adjustment was associated with less forgetting of medications. Thus, while marital adjustment has some effect in the entire sample, clearly, the greatest effect is within those couples aged 50 years and less.

Logistic Regression

Three of the compliance variables were measured categorically. Technically, these measures do not fit the rules for simple multiple regression analysis and instead should be tested within a logistic regression. To see whether the original analyses

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Table 6. The Association between the Dyadic Adjustment Scores and Antihypertension Compliance Measures within the Group Aged 51 to 65 Years (Partial Correlation Coefficients).

Dependent Compliance Variables	Independent Variables			
	Dyadic Adjustment	Women	Black	Education
Obesity	−0.05	0.36†	0.09	−0.10
Forgetting medications	−0.22*	0.18	−0.18	0.10
Stopping medications	−0.19	−0.003	−0.09	−0.05
Stopped smoking	0.17	0.04	−0.39†	0.16
Amount of alcohol	0.01	−0.37†	−0.19	0.08
Regular exercise	−0.16	0.08	−0.16	−0.25
Diastolic blood pressure	0.10	−0.09	0.04	0.05

*P < 0.05. †P < 0.01.

were a fair representation of these variables, the relations between dyadic adjustment and stopping medications, smoking cessation, and little or no exercise versus regular exercise were retested using logistic regressions. The findings were similar (Table 7). Where relations were significant initially, they continued to be significant in these tests. No new relations were found. Therefore, we believe that the initial multiple regression findings are fair representations of these three variables also.

Discussion

The following potential limitations to this study of married patients who are currently being treated for hypertension should be noted. Black men are considerably underrepresented in the sample. Therefore, it is probable that the data cannot be generalized to this group.

It is possible that the results of our study do not generalize to the national population. We had an unusually high percentage of hypertensive patients whose diastolic blood pressure was controlled (≥ 70 percent). National studies have indicated that only about 50 percent of treated hypertensives comply sufficiently with medical recommendations to maintain adequate blood pressure control. However, if this is the case, the effect of dyadic adjustment on compliance measures could be underestimated in the study sample because it would be harder to detect an effect in a well-controlled sample.

In spite of the cross-sectional or correlational design, the study results do add to the growing body of evidence that better marital adjustment contributes to greater compliance with prescribed medical regimens. The linear association between lower dyadic adjustment scores and higher frequency of forgetting antihypertensive medications or stopping medications for periods of several days or weeks presents a clear example of support for the hypothesized association be-

Table 7. The Association between the Dyadic Adjustment Scores and Categorical Compliance Measures, Adjusted for Age, Gender, Race, and Education (Partial Correlation Derived from Logistic Regression).

Dependent Compliance Variables	Independent Variables (Chi-Square)				
	Dyadic Adjustment	Age	Women	Black	Education
Stopped medications	6.39†	0.29	0.73	0.04	0.05
Stopped smoking	0.03	7.11†	0.41	6.08*	7.68†
Amount of physical activity	1.05	1.91	0.01	1.67	0.71

*P < 0.05. †P < 0.01.

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tween dyadic adjustment and greater compliance. The association between greater marital adjustment and lower rates of obesity is an indirect measure of compliance.

The higher dyadic adjustment rates for white men in the study compared with white women may be partially explained by differences in the way men and women respond to events, circumstances, and interactions that move a couple back and forth on the continuum of dyadic adjustment. As previously noted, most national surveys have found men to report more satisfaction with marriage than women. Some have attributed this to the less pleasurable and more caretaking roles women are assigned.

Our study shows an association between dyadic marital adjustment and three important antihypertension compliance measures. This finding suggests the need for an intervention study to test whether training couples to improve their functioning in the areas measured by the Dyadic Adjustment Scale would significantly improve compliance. Furthermore, it seems evident that such training should be geared to couples aged ≤ 50 years because this is where the greatest effect may be. While younger patients in this sample were less compliant, older patients were generally more compliant. It is plausible that older patients are more compliant because they are cognizant of their approaching mortality and because they have been married longer. If the finding that patients aged ≤ 50 years are less compliant is typical of the national population, it seems logical that future studies of all types of intervention should be geared toward this age group. It would also be useful to repeat the present study as well as conduct interventions on less compliant samples than the present one. It can be argued that the effect found in the present study would be much greater in a largely uncontrolled hypertensive sample.

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