The Marital Relationship and Psychosocial Adaptation and Glycemic Control of Individuals With Diabetes

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OBJECTIVE — To explore the relationship between marital relationship domains (i.e., intimacy and adjustment) and glycemic control and psychosocial adaptation to diabetes.

RESEARCH DESIGN AND METHODS — A total of 78 insulin-treated adults with both type 1 and type 2 diabetes were assessed on a single occasion. They completed two marital quality measures (Spanier Dyadic Adjustment Scale and Personal Assessment of Intimacy in Relationships Scale) and four quality-of-life measures (Diabetes Quality of Life Scale, Medical Outcomes Study Health Survey, Problem Areas in Diabetes Scale, and Positive and Negative Affect Scale). Glycemic control was assessed by HbA_{1c}. Demographic data (age, sex, type and duration of diabetes, years married, other medical conditions, family history, disability, and years of education) were gathered from the chart and questionnaires.

RESULTS — Concerning psychosocial adaptation, both of the marital quality measures were predictors of aspects of adaptation. Better marital satisfaction was related to higher levels of diabetes-related satisfaction and less impact, as well as less diabetes-related distress and better general quality of life. Higher levels of marital intimacy were related to better diabetes-specific and general quality of life. Concerning glycemic control, there was a nonsignificant trend for marital adjustment scores to relate to HbA_{1c} ($P = 0.0568$).

CONCLUSIONS — For insulin-treated adults with diabetes, quality of marriage is associated with adaptation to diabetes and other aspects of health-related quality of life. The suggestive finding that marital adjustment may relate to glycemic control warrants further study. Future work should also explore the impact of couples-focused interventions on adaptation, adherence, and glycemic control.

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A large body of research suggests that support from others can facilitate recovery from a physical illness and enhance the ability to cope with and adapt to the consequences of chronic illness (1). A subset of social support studies has focused on the family as a major source of support, finding that stronger family support relates to such varied outcomes as better psychological adjustment (2) and enhanced compliance with medical regimens (3).

Studies of families of individuals with diabetes have confirmed the importance of family support. Studies of children and adolescents with type 1 diabetes (4,5), as well as studies of adults with type 2 diabetes (6,7), have found that better illness adaptation and treatment adherence relate to high family cohesion and low family conflict. Addressing physical outcomes, cross-sectional studies have shown a relationship between social support and glycemic control both with samples of adolescents (8) and adults (9). Schwartz et al. (10), in a prospective study of type 2 diabetic adults, found that a decrease in social support predicted a worsening of blood glucose (BG) control over time.

Support from one's spouse has been found to be the most important source of support during illness episodes (11), although disruptions in the marital relationship often occur when one partner has a chronic illness. The importance of marital support, and conversely the harmful effects of marital conflict, has been demonstrated for patients with chronic diseases, but scant attention has been paid to the marital relationship for individuals with diabetes. Katz (12) found that the self-management behavior of husbands with diabetes often deteriorates when conflict exists with their wives. Others have shown that the spouse's belief in the importance of BG control predicts such control better than the patient's beliefs (13). Evidence cited in a recent review (14) of the diabetes literature argues for the importance of considering the family as the setting of disease management, but it is clear that more work needs to be done to understand the role that the marital relationship may play both in physical (BG control) and psychological (illness adaptation) outcomes.

The purpose of the present study was to explore the relationship between several domains of the marital relationship and the physical and psychosocial outcomes achieved by individuals with diabetes. The specific marital areas we examined included overall marital adjustment and intimacy. Our main hypotheses were *1)* better marital adjustment will be associated with better patient adaptation to diabetes and *2)* better marital adjustment will be associated with better BG control.

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Abbreviations: BG, blood glucose; DAS, Spanier Dyadic Adjustment Scale; DCCT, Diabetes Control and Complications Trial; DQOL, Diabetes Quality of Life Scale; MCS, Mental Composite Scores; PAID, Problem Areas in Diabetes Scale; PAIR, Personal Assessment of Intimacy in Relationships; PANAS, Positive and Negative Affect Schedule; PCS, Physical Composite Scores; SF-36, Medical Outcomes Study Health Survey.

A table elsewhere in this issue shows conventional and Système International (SI) units and conversion factors for many substances.

RESEARCH DESIGN AND METHODS

— A total of 78 subjects were recruited at the Joslin Diabetes Center at SUNY Upstate Medical University in Syracuse, New York. Potential participants were identified from chart review to determine if they met the following inclusion criteria: between 18 and 55 years of age, diagnosed with diabetes for ≥1 year, use insulin daily (only insulin-requiring patients were included in order to minimize the potential effect of type of treatment), have been married for ≥1 year, and are able to provide written informed consent. Patients were approached by a research assistant at their regularly scheduled health care visit and if enrolled they completed questionnaires and returned them by mail. Demographic and medical data were gathered from the chart. This study was approved by the institutional review board of the SUNY Upstate Medical University.

Metabolic control was determined by measuring HbA_{1c} using the DCA 2000+ Analyzer (Bayer, Elkhart, IN). HbA_{1c} values reflect the average BG over the preceding 3 months and is widely accepted as a reliable and valid index of metabolic control. This test was completed as a routine part of their clinic visit. Staff collecting the data were blind to other research data.

Marital quality measures

Spanier Dyadic Adjustment Scale. The Spanier Dyadic Adjustment Scale (DAS) (15) is a 32-item self-report measure of marital quality that is widely used as a measure of marital adjustment. It has four subscales that measure marital satisfaction, cohesion, consensus, and affectional expression. A higher score indicates better marital quality. The DAS has shown good reliability (Cronbach's $\alpha = 0.96$). Construct validity data indicate that the DAS discriminates well between divorced and currently married samples (15) and also correlates highly with the widely used Locke-Wallace Marital Adjustment Test (16).

Personal Assessment of Intimacy in Relationships Scale. The Personal Assessment of Intimacy in Relationships (PAIR) Scale (17) is a 36-item self-report measure of perceived marital intimacy that includes emotional, social, sexual, intellectual, and recreational intimacy domains. The PAIR Scale has shown good reliability, with all of the scales having Cronbach's α of ≥0.70. Validity has been demonstrated with significant Pearson correlations of the PAIR subscales with the Locke-Wallace Marital Adjustment Scale (range 0.41–0.98) and the Moos Family Environment Scale (17). As in previous research (18), an overall measure of intimacy was created by summing the scale scores. Respondents rated (on a five-point Likert scale) how much they agree or disagree with intimacy-relevant statements, such as "My partner listens to me when I need someone to talk to" and "We have very few friends in common." Direction of scoring was transformed so that a higher overall score reflected increased levels of intimacy.

Psychosocial adaptation measures

Diabetes Quality of Life Scale. The 46-item Diabetes Quality of Life (DQOL) Scale, developed by Jacobson and colleagues (19), assesses four aspects of quality of life specific to diabetes. For this study we used two of the subscales: satisfaction and impact. For example, subjects rated (on a five-point scale) how satisfied they were "with the amount of time it takes to manage your diabetes" and "how often do you feel pain associated with the treatment of your diabetes?" Cronbach's α reported for the scales ranged from 0.67 to 0.92, with 1-week test-retest reliabilities of 0.80–0.90 and good convergent validity demonstrated with evidence of significant correlation of the DQOL Scale with other quality-of-life measures (20).

Medical Outcomes Study Health Survey. The 36-item Medical Outcomes Study Health Survey (SF-36) (21) assesses eight domains of functional health status and is widely used to assess health-related quality of life. These eight scale scores were used to calculate Physical Composite Scores (PCS) and Mental Composite Scores (MCS), as described elsewhere (22). The PCS includes subscales that measure physical function, role function–physical (i.e., the extent to which physical problems limit one's role function), bodily pain, and general health. The MCS includes subscales that measure vitality, social function, mental health, and role function–emotional (i.e., the extent to which one's emotional problems limit one's role function). Internal consistency reliabilities range from 0.81 to 0.88, and good correlations with other general quality-of-life measures support its validity (23).

Problem Areas in Diabetes Scale. The 20-item Problem Areas in Diabetes (PAID) Scale (24) assesses diabetes-specific emotional distress. It lists situations that are commonly problematic for individuals with diabetes and asks subjects to rate, on a six-point scale (1 = no problem to 6 = a serious problem), the degree to which the situation is a problem for them. Sample items are "poor blood glucose control" and "feeling overwhelmed by your diabetes regimen." Internal reliability is high (Cronbach's $\alpha = 0.95$). Significant association with relevant psychosocial measures of distress, HbA_{1c}, and reported self-care behaviors (25) and responsiveness to intervention (26) have been established in the literature.

Positive and Negative Affect Schedule. The Positive and Negative Affect Schedule (PANAS) (27) is a 20-item measure of psychological well-being comprised of two 10-item scales that measure positive affect (extent to which the person feels enthusiastic, active, and alert) and negative affect (extent to which the person experiences subjective distress, including anger, contempt, disgust, guilt, fear, and nervousness). The PANAS has demonstrated good reliability (Cronbach's α 0.84–0.90), and convergent/discriminant validity is high (convergent correlations of scales with factors range from 0.89 to 0.95), whereas discriminant correlations are low (ranging from −0.02 to −0.18). Significant correlations with other accepted measures of psychological distress (e.g., Beck Depression Inventory) support its external validity. Subjects were asked to rate (1 = very slightly to 5 = very much) the extent to which they had experienced 10 positive and 10 negative feelings during the previous 4 weeks.

Demographic data

The patients' medical charts provided information on age, sex, diabetes type, and duration of diabetes. Patients also completed a questionnaire that asked about number of years married, family history of diabetes, number of other health problems (a health-problem checklist, e.g., asthma and cancer), vocational disability because of diabetes, and years of education.

Statistical analysis

Data analysis was completed in stages. Descriptive statistics provided informa-

Table 1—*Demographic characteristics of subjects*

Age (years)	45.8 ± 11.33 (25–65)
Sex	
Male	33 (43.3)
Female	45 (57.7)
Education (years)	14.0 ± 2.5 (6–22)
Years married	19.2 ± 12.93 (1–49)
Work disability	10 (13)
Diabetes type	
Type 1	44 (57.1)
Type 2	34 (43.9)
Duration of diabetes (years)	16.9 ± 10.55 (1–42)
Family history of diabetes	41 (52.6)
Number of health conditions	2.9 (2.4)*
Glycemic control	
Poor (HbA_{1c} >8.4)	25 (32.5)
Acceptable (HbA_{1c} 7.4–8.4)	24 (31.2)
Good (HbA_{1c} <7.4)	28 (36.4)
Number of respondents	78

Data are means ± SD (range) or *n* (%). *Range: 0–10.

tion on all variables. Forward stepwise–regression techniques were used in the development of models to explore the inter-relationships among variables. Variables were entered into the model if they met a 0.1500 significance level. *F* values were computed for differences among the groups. Data were analyzed using SAS version 8.0 on a SunOS platform (SAS, Cary, NC). All analyses were established a priori at $P < 0.05$ for acceptance. Multiple-comparison corrections were used. Models predicting adaptation were first estimated with a set of background variables, including age, sex, education, diabetes type, duration of diabetes, number of other health conditions, family history of diabetes, number of years married, and presence of a work disability. The sociodemographic variables that were found to contribute significantly to the model were entered first. Each measure of marital quality (DAS and PAIR) was then separately entered into each model, for a total of 16 models, with each measure of marital quality predicting PCS and MCS of the SF-36, positive and negative affect (PANAS), diabetes satisfaction and impact (DQOL), diabetes-specific emotional distress (PAID), and glycemic control (HbA_{1c}).

RESULTS — The demographic characteristics of the sample population are presented in Table 1. The mean age of the group was 45.8 years; ~58% of the sample was female, the average level of education was 14 years, and the mean length of marriage was >19 years. Over half (57%) of the sample had type 1 diabetes, and the respondents were distributed across levels of glycemic control as measured by HbA_{1c} levels. Of the sample population, 13% reported a disability that limited their ability to work, and the respondents had an average of 2.9 other health problems.

Psychosocial adaptation

Table 2 summarizes the results of stepwise regression analyses of the effect of marital adjustment on psychosocial adaptation. The first analyses examined the power of relevant variables to predict psychosocial adaptation to diabetes (DQOL, PAID, PANAS, and SF-36). Models containing only the demographic control variables were estimated for each of the dependent variables. The demographic variables were significant predictors of both DQOL Satisfaction ($F = 8.32$, $P \leq 0.0001$) and Impact ($F = 5.41$, $P \leq 0.0021$). The control models also were significant for the PAID ($F = 5.47$, $P \leq 0.0020$) and the PCS ($F = 10.52$, $P \leq 0.0001$).

Examination of the DQOL found that fewer health problems ($F = 9.09$, $P \leq 0.0036$) and a greater number of years married ($F = 13.99$, $P \leq 0.0004$) predicted increased diabetes satisfaction and less diabetes impact ($F = 11.74$, $P \leq 0.0010$, and $F = 3.53$, $P \leq 0.0644$, respectively). There were trends for female sex to predict lower satisfaction ($F =$

Table 2—*Stepwise regression analyses examining the effect of marital adjustment on psychosocial adaptation*

Independent variable	Negative affect	Positive affect	DQOL satisfaction	DQOL impact	PAID	PCS	MCS
Control variables only							
Model R^2	0.2225	0.0677	0.2775	0.1903	0.1968	0.4291	0.1180
F	4.65	1.18	8.32*	5.41*	5.47*	10.52*	1.87
PAIR total							
Model R^2	0.2668	0.2331	0.3322	0.2171	0.2707	NS	0.2099
F	3.86	13.80*	5.24†	2.33	6.68†	—	6.40†
DAS overall							
Model R^2	0.3352	0.2487	0.4085	0.2781	0.2996	NS	0.2963
F	7.59†	15.42*	9.42†	6.34†	9.91†	—	10.10†

Model R^2 occurs when the relevant independent variable (either PAIR or DAS) is added to the model. Models for positive and negative affect control for number of health conditions, duration of diabetes, sex, and number of years married. Models for DQOL impact and satisfaction control for number of health conditions, number of years married, and sex. Model for PAID controls for number of health conditions, diabetes type, family history of diabetes, and sex. *F* test and significance levels are indicated for the change in variance when the index variable is added to the model. NS indicates not significant at the 0.150 level to permit entry into the model. *$P \leq 0.001$; †$P \leq 0.05$.

3.21, $P \leq 0.0777$) and greater impact ($F = 3.97$, $P \leq 0.0502$). Therefore, these variables were included in subsequent analyses. When these variables were controlled, the DAS was a predictor of both increased diabetes satisfaction ($F = 9.42$, $P \leq 0.0032$) and less impact ($F = 6.34$, $P \leq 0.0143$), whereas an increased PAIR related to less impact ($F = 6.68$, $P \leq 0.0120$).

Examination of the PANAS found that an increased number of health problems ($F = 8.18$, $P \leq 0.0056$), a shorter duration of diabetes ($F = 6.51$, $P \leq 0.0129$), and female sex ($F = 5.12$, $P \leq 0.0268$) predicted more negative affect, with a trend for number of years married ($F = 3.02$, $P \leq 0.0868$). There was a trend for an increased number of health problems to relate to less positive affect ($F = 2.53$, $P \leq 0.1165$). When these variables were controlled, an increased DAS score was a significant predictor of more positive affect ($F = 15.42$, $P \leq 0.0002$) and less negative affect ($F = 7.59$, $P \leq 0.0078$), whereas an increased PAIR related to more positive affect ($F = 13.80$, $P \leq 0.0004$).

Examination of the PAID found that a greater number of years married ($F = 5.73$, $P \leq 0.0193$) and a decreased number of health problems ($F = 6.89$, $P \leq 0.0106$) were significant predictors of less diabetes-related emotional distress, with a trend for lower number of years of education ($F = 2.84$, $P \leq 0.0965$); these variables were included in further analyses. When these variables were controlled, an increased PAIR ($F = 6.68$, $P \leq 0.0120$) and an increased DAS ($F = 9.91$, $P \leq 0.0025$) predicted lower PAID scores.

Examination of the SF-36 found that a decreased number of health problems ($F = 41.29$, $P \leq 0.0001$) and type 2 diabetes ($F = 4.50$, $P \leq 0.0378$) were significant predictors of lower PCS (i.e., poorer physical function), with a trend for family history of diabetes ($F = 2.37$, $P \leq 0.1289$). An increased number of health problems ($F = 5.87$, $P \leq 0.0183$) and female sex ($F = 4.25$, $P \leq 0.0435$) predicted lower MCS (i.e., poorer mental health and function). When these variables were controlled, neither the DAS nor the PAIR met the criteria for inclusion into the models predicting the PCS, whereas both higher PAIR ($F = 6.40$, $P \leq 0.0143$) and DAS ($F = 10.10$, $P \leq 0.0025$) significantly related to higher MCS.

Glycemic control

When HbA_{1c} was treated as a continuous variable, the marital-quality measures did not predict glycemic control. We then divided subjects into three groups. Good glycemic control was defined as ≤7.4% (normal ≤6.4%) based on the levels achieved in the Diabetes Control and Complications Trial (DCCT). Acceptable glycemic control was defined as an HbA_{1c} value of 7.5–8.4%, and poor glycemic control was defined as an HbA_{1c} value of >8.4% based on the DCCT findings, which demostrate that the risk of significant microvascular complications dramatically increases when HbA_{1c} levels are >8.4%. Recognition of the stringency of these criteria (i.e., 64% needed improved glycemic control) highlights the fact that intensive psychosocial intervention was necessary to achieve good glycemic control in the DCCT. Because of small numbers, we combined acceptable and poor glycemic control subjects for our analyses. After HbA_{1c} levels were dichotomized into two groups (HbA_{1c} <7.4 and ≥7.4%), scores on the DAS were predictive of glycemic control, although the effect just missed acceptable statistical significance ($P = 0.0568$). The PAIR did not relate to glycemic control.

CONCLUSIONS

— The data indicate that marital quality does relate to an individual's adaptation to diabetes. Individuals who described a better overall marital adjustment and higher levels of perceived marital intimacy also reported that they were more satisfied with varied aspects of their own adaptation to the illness (e.g., treatment, appearance, and activities), felt diabetes has less of a negative impact, and experienced less diabetes-specific emotional distress. These individuals also reported better mental health–related quality of life, including better social and emotional functioning, mental health, and overall well-being.

Although no relationship was found between glycemic control and intimacy, a strong trend relating good glycemic control to good marriages was found. Given the numerous factors that affect glycemic control (e.g., degree of insulin deficiency, insulin resistance, and diet), it has been difficult to demonstrate an effect for any specific psychosocial variable. Our previous work found that family support related to adaptation, but not to glycemic control (6). The current findings suggest that the marital relationship may be more powerful than general family support in terms of its impact on glycemic control.

The study design was cross-sectional; therefore causality could not be determined. Thus, the data could not distinguish between the interpretation that a poor marital relationship leads to poor illness adaptation and/or glycemic control and the hypothesis that poor control and/or adaptation leads to a more problematic marital relationship

It is likely that both effects occur. Marital role theory (28) emphasizes adequate role performance mastery and the individual's and couple's capacity to adapt as being critical to marital adjustment. When we marry, we develop specific role expectations for our spouses. Marital role strain is likely when expectations are not met, when mastery is not demonstrated, and when the couple does not adapt to new situations. When one partner develops a chronic illness such as diabetes, the need for adaptation is significant and strains are inevitable. Such strains might be minimal, allowing for intimacy and positive marital adjustment, if the partner with diabetes demonstrates mastery over the illness and the care regimen and has achieved good glycemic control. However, if the partner with diabetes is struggling or opting out, both partners may feel inadequate, and marital distance may follow. Similarly, when the strains of a chronic illness are experienced within an intimate and accepting marriage, the couple should be able to realign their expectations of each other, master the areas they still can control, and support each other's efforts to successfully adapt. However, if the marriage was distant before the demands of the illness, the adjustment may not go smoothly. In both cases, a negative marital relationship might affect the individual's adjustment and his/her ability to maintain the diabetes care regimen and good glycemic control. A third possibility is that the marital-illness correlations reflect a relationship between these variables and another unmeasured variable. For example, it may be that individuals who take poor care of their diabetes also take poor care of their marriages, so that the observed relations stem from a third factor, such as degree of denial or use of passive coping styles.

We chose to study both type 1 and type 2 diabetic subjects who were being treated with insulin. This approach, which has been adopted by others (29,30), reasons that regular insulin administration produces unique challenges, the impact of which are lost when studies group by type only and thus group together subjects who are merely watching their diets with those who must regularly measure BG and inject insulin, as well as deal with the potential effects of too much or too little insulin. Although diabetes type is a major dichotomy from a medical perspective (and is included in our data analysis), we believe that insulin treatment is a major dichotomy from a psychological and behavioral perspective that has ramifications for adaptation, quality of life, and, perhaps, the marital relationship. The fact that diabetes type was found only once as a significant predictor of our dependent variables (having type 2 diabetes related to poorer physical function) appears to support this approach. However, by studying this group we also limited the generalizability of our findings to the group of insulin-treated individuals.

The demographic data point to interesting areas that deserve further study. Not surprisingly, individuals who have a greater number of health problems were more likely to report difficulty adapting. Women were also more likely to be struggling, whereas individuals who had been married for a longer time were doing better. These findings may relate to different gender roles, levels of social support, or other factors. For example, women who are ill may respond differently than men, as they are often seen as the nurturers and may be less comfortable in a role in which they are the one being helped. Patients in long-term stable marriages may reap the benefits of the stress-buffering effect of social support. Seeing patients as whole human beings who are not only dealing with their diabetes but also possibly dealing with other health problems, role conflicts, and varying levels of support should result in greater attention being paid to more emotionally vulnerable groups.

There are methodologic limitations to the study. The fact that the strongest relationships were found among self-report paper-pencil measures rather than between these measures and HbA_{1c}, a physiological index, may mean that response style inflated these correlations. Also, we note that the average number of years married of our sample was 19.2 years, that the mean duration since diabetes was diagnosed was 16.9 years, and that our results may have been different if our subjects had been married and/or diagnosed for a shorter period of time. We cannot generalize to all married individuals with diabetes. Finally, we note that our subjects had an average of 2.9 other health problems. We do not have data comparing Joslin Center patients to those treated at other sites; our patients may be more ill or in other ways not representative of diabetes patients as a large group. Therefore, efforts to replicate these findings at other sites are warranted.

The interaction between marital- and diabetes-related variables points to the importance of understanding the context that the marital relationship provides for our patients' efforts to manage their diabetes. In addition, the development of couples-focused intervention is warranted, and future studies should be designed to determine whether helping the partner to be more supportive or the couple to be more intimate has an impact on adaptation to diabetes and adherence to the medical regimen and/or glycemic control.

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