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SETBACKS IN DIET ADHERENCE AND EMOTIONAL DISTRESS: A STUDY OF OLDER PATIENTS WITH TYPE 2 DIABETES AND THEIR SPOUSES

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Abstract

Objectives—We investigated patients’ difficulties in managing their diet (i.e., diet setbacks) and associations with change in disease-specific and general emotional distress (diabetes distress and depressive symptoms) among patients with type 2 diabetes and their spouses.

Method—Data for this study were collected in couples’ homes ($N = 115$ couples) using structured interviews and self-administered questionnaires at three time points: baseline (T1), six months after baseline (T2), and twelve months after baseline (T3).

Results—Patients’ diet setbacks were associated with an increase in their diabetes distress in the shorter-term (over six months). Patients’ diet setbacks were not associated with longer-term change in diabetes distress or with change in depressive symptoms at either time point (six months or one year). In contrast, *spouses’* perceptions of patients’ diet setbacks were associated with increases in their own diabetes distress at both time points (over six months and one year), and also with an increase in their depressive symptoms in the longer-term (over one year).

Conclusion—Findings reveal detrimental consequences of patients’ diet nonadherence for emotional well-being that extend to the well-being of their spouses.

Keywords

chronic illness management; diabetes distress; depressive symptoms

SETBACKS IN DIET ADHERENCE AND EMOTIONAL DISTRESS: A STUDY OF OLDER PATIENTS WITH TYPE 2 DIABETES AND THEIR SPOUSES

Many older adults are managing at least one chronic condition each and every day (Yancik et al., 2007). For many patients with chronic illness, the persistent demands of illness management can exact a significant toll on their emotional health (Fisher et al., 2008; Franks, Lucas, Stephens, Rook, & Gonzalez, 2010). Emerging dyadic perspectives on chronic illness (e.g., Berg & Upchurch, 2007; Revenson, 1994) posit that emotional costs associated with chronic disease management reach beyond the individual patient to affect others, such as a spouse, who shares the illness context. Yet, little research has examined emotional costs to spouses associated with patients' chronic disease management. In our study, we examined patients' diet adherence and association with change in emotional distress (diabetes distress and depressive symptoms) among patients with type 2 diabetes and their spouses. Central to our investigation was whether change in patients' and spouses' emotional distress was a function of lapses in patients' diet management, which we refer to as diet setbacks.

Management of Diabetes

Type 2 diabetes is a chronic disorder of the endocrine system, and this type of diabetes accounts for the vast majority of cases of diabetes (only 5 to 10% of individuals with diabetes have type 1 diabetes; Centers for Disease Control and Prevention, 2011). Diabetes affects approximately one in four Americans over the age of 65, and is among the leading causes of death of older adults in the United States (Centers for Disease Control and Prevention, 2011). The prevalence of diabetes is expected to rise for all adults, leading to increases in the personal and societal burden of managing this disease (Huang, Basu, O'Grady, & Capretta, 2009).

The management of diabetes requires vigilant and sustained adherence to a complex and coordinated treatment regimen comprising multiple health behaviors, including diet, exercise, and use of prescribed medications (e.g., Centers for Disease Control and Prevention, 2011; Halter, 1999). Proper daily management of diabetes reduces patients' risk of serious complications such as heart disease and stroke, neuropathy, and nephropathy (Gonder-Frederick, Cox, & Ritterband, 2002; Halter, 1999). Notably however, poor disease management can cumulatively, and sometimes irreversibly, affect health outcomes of older patients. Despite encouragement from health-care providers and warnings about the harmful consequences of treatment nonadherence, many patients are unsuccessful in sustaining recommended lifestyle behaviors.

Diabetes Distress and Depressive Symptoms

Emotional distress directly related to sustaining a daily diabetes regimen is common among patients (e.g., Peyrot et al., 2005; Polonsky et al., 1995). Patients identify feelings of worry and sadness about living with diabetes (Penckofer, Ferrans, Velsor-Friedrich, & Savoy, 2007) and anxiety about poor disease management (Polonsky et al., 1995, 2005; Snoek, Pouwer, Welch, & Polonsky, 2000). Additionally, many patients with diabetes experience worry and concern about their future and the possibility of serious complications of their disease.

Among patients, as concerns with their diabetes management escalate, their levels of general emotional distress often become elevated as well (Fisher et al., 2007; Franks et al., 2010; Polonsky et al., 1995). Overall, the risk of experiencing depressive symptoms is greater among patients with diabetes than among individuals who do not have diabetes (Engum et al., 2005; Nouwen et al., 2010). Even patients who do not meet clinical criteria for major

depressive disorder may nonetheless experience diabetes distress or depressive symptoms, and these experiences may persist over time (Fisher et al., 2007, 2008).

The emotional consequences of diabetes and its management are not limited to patients alone (Fisher et al., 2002). Rather, patients and spouses frequently agree that diabetes is a problem that they share or that affects the two of them (Franks & Iida, 2010). Moreover, one partner's diabetes and its management can be a source of disease-specific distress and general symptoms of depression for both marital partners (Fisher, Chelsa, Skaff, Mullan, & Kanter, 2002; Franks et al., 2010). Yet, limited research attention has been paid to the emotional distress of spouses who often share in managing illness demands of their partners with diabetes.

Diet Nonadherence, Diabetes Distress, and Depressive Symptoms

Dietary management is a central lifestyle component in the management of diabetes (Centers for Disease Control and Prevention, 2011; Halter, 1999). Patients with diabetes generally receive recommendations and education from healthcare providers about improving their daily diet. Despite emphasis on nutrition management, some patients do not recall receiving diet recommendations at all (Rubin et al., 1991), and many who receive nutrition recommendations have considerable difficulty in making and maintaining healthful modifications to their daily diet (Murata, Duckworth, Shah, Wendel, & Hoffman, 2004; Nothwehr & Stump, 2000; Peyrot et al., 2005; Rubin et al., 1991).

Adhering to a healthful diet is more challenging to many patients than administering prescribed medication to manage their diabetes (e.g., Rubin et al., 1991; Williams & Bond, 2002). Although patients report that they follow insulin prescriptions "always or almost always," they report following dietary recommendations only "somewhat more than half the time" (Vijan et al., 2004). Notably, some patients with diabetes report making no dietary changes (Huang et al., 2005). For patients who struggle to maintain a healthful diet, poor dietary adherence can be associated with feelings of guilt and worry related to diabetes and its management (e.g., Delahanty et al., 2007).

Patients' difficulties in maintaining a healthful diet rarely go unnoticed by their spouses. In fact, diet choices may be the aspect of patients' diabetes regimen most visible to their spouses (Beverly, Miller, Wray, 2008; Trief et al., 2003). Spouses commonly assist patients with planning and preparing healthful meals, and share healthful meals with their partners. Many spouses also carefully monitor patients' dietary adherence and engage in strategies of control to try to improve patients' diet choices when adherence is not optimal (August & Sorkin, 2010; Stephens, Rook, Franks, Khan, & Iida, 2010). Thus, spouses' perceptions of their partners' successes and failures in managing diet choices may be closely tied to their own worries and concerns about patients' disease management.

Present Study Aims and Hypotheses

We explored patients' difficulties with dietary adherence as a challenge that arouses feelings of emotional distress for patients who are managing type 2 diabetes. Consistent with the contextual approach of Berg and Upchurch (2007), we also investigated challenges of diet adherence among patients as a potential source of emotional distress among their spouses. Given our parallel focus on responses of patients and of spouses to the diabetes context (i.e., emotional distress), we investigated the association of patients' dietary behaviors with change in each partner's emotional distress.

Specifically, we investigated setbacks in patients' diet management as a predictor of increases in patients' and spouses' diabetes-specific and general emotional distress (diabetes distress and depressive symptoms). We conceptualized diet setbacks from the perspective of

patients, i.e., patients' acknowledgement of difficulties adhering to diet recommendations, and also from the perspective of spouses, i.e., spouses' perception of patients' difficulties in adhering to diet recommendations. Although assessment of diet adherence often reflects patients' reports of their recent diet choices, less attention has been paid to their perceptions that their adherence has been unstable or intermittent. Thus, diet setbacks in our study reflect patients' and spouses' perceptions that lapses have taken place in patients' adherence to a recommended diet plan.

Our primary hypothesis was that setbacks in patients' diet management would be associated with elevated levels of diabetes distress and depressive symptoms among patients. We also anticipated that setbacks in patients' diet management similarly would be associated with elevated emotional distress among their spouses. We investigated the role of patients' diet setbacks in eliciting emotional distress at two time points: 1) in the shorter-term over six months, and 2) in the longer-term over one year.

Method

Participants and Procedure

Couples were recruited as part of a larger 3-wave panel study investigating relational influences in older adults' diabetes management. In order to qualify for the study, one partner (patient) had to have a primary medical diagnosis of type 2 diabetes and be at least 55 years of age; the other partner (spouse) had to be living in the same household as the patient and could not have a diagnosis of diabetes. Additionally, couples had to have been married (or cohabiting) for at least one year.

A total of 235 couples was screened for eligibility. Of these, 58 couples (24.6%) were not eligible. The most frequent reasons for ineligibility were that both spouses had diabetes ($N=17$) and that the patient was younger than 55 years of age ($N=12$). Among eligible couples, 48 (27.1%) declined to participate. The most frequent reasons given for nonparticipation were lack of interest ($N=8$) and lack of time ($N=5$).

The baseline sample consisted of 129 couples, yielding a response rate of 72.9% for eligible couples. Five couples left the study before T2, and an additional seven couples left before T3, yielding an attrition rate of 9.3%. Reasons for attrition included death or illness ($N=2$), relationship dissolution ($N=1$), and inability to contact ($N=1$). The present study includes 115 couples who provided complete data on key study constructs (i.e., diet setbacks, diabetes distress, depressive symptoms) at all three assessment time points. These 115 couples were compared with the 14 couples who did not provide complete data at all three time points in terms of their demographic characteristics and levels of key study constructs. Couples who provided complete data differed in only one respect from couples who did not: patients and spouses who provided data at all three time points were more likely to be Caucasian, relative to those who did not (for patients, 93.8% vs. 75.8%; $\chi^2(1) = 2.54, p < .05$; for spouses, 93.9% vs. 73.3%; $\chi^2(1) = 2.82, p < .01$).

Sample characteristics of the participating 115 couples are displayed in Table 1. Approximately one half of patients were female (51.3%), and they had been diagnosed with diabetes for an average of about 12 years. Couples had been married for an average of 38 years.

Measures

Data were collected in couples' homes at three time points: baseline (T1), six months after baseline (T2), and twelve months after baseline (T3). Trained staff conducted structured

interviews with each partner separately. Additionally, while each partner was being interviewed, the other partner completed a self-administered questionnaire.

Diet Setbacks—At T2, patients and spouses independently reported the extent to which patients had experienced setbacks in their dietary management (since their baseline interview) using four items created for this study: “How often in the past SIX MONTHS did” 1) you feel that you (your spouse) were doing a poor job of following your (his/her) diabetic diet, 2) you (your spouse) have significant setbacks in following your (his/her) diabetic diet, 3) you feel like you (your spouse) simply were not able to follow your (his/her) diabetic diet, and 4) circumstances in your (your spouse’s) life cause you (him/her) to get significantly off track with your (his/her) diabetic diet. These items were rated on a scale from 0 (*never*) to 4 (*always*), and the sum of these items could range from 0 to 16. The mean for patients was 5.65 (SD = 2.95; range = 0–14; $\alpha = .84$), and the mean for spouses was 4.97 (SD = 3.26; range = 0–14; $\alpha = .88$). An additional item was used to assess spouses’ involvement in helping patients resume their diabetic diet when they experienced a lapse in their dietary management. Patients and spouses each indicated whether or not the spouse tried to help the patient resume the diabetic diet following diet setbacks.

Diabetes Distress—At each interview, patients and spouses reported the extent to which they had worries and concerns about diabetes in the past month using items from the Problem Areas in Diabetes Scale (PAID; Polonsky et al., 1995). This measure consists of 20 items (e.g., worrying about the future and possibility of serious complications) that were rated on a scale from 0 (*no problem*) to 5 (*serious problem*). Summed scores could range from 0 to 100. At T1, the patient mean was 24.28 (SD = 22.52; range = 0–94; $\alpha = .97$), and the spouse mean was 17.16 (SD = 14.54; range = 0–67; $\alpha = .92$). At T2, the patient mean was 20.81 (SD = 20.33; range = 0–86; $\alpha = .97$), and the spouse mean was 14.97 (SD = 13.78; range = 0–58; $\alpha = .93$). At T3, the patient mean was 19.53 (SD = 20.08; range = 0–90; $\alpha = .97$), and the spouse mean was 14.28 (SD = 12.96; range = 0–47; $\alpha = .92$).

Depressive Symptoms—At each interview, patients and spouses reported the extent to which they had experienced depressive symptoms in the past week using the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). This measure consists of 20 items (e.g., I was bothered by things that don’t usually bother me) that were rated on a scale from 0 (*rarely or none of the time*) to 3 (*most of the time*). Summed scores could range from 0 to 60. At T1, the patient mean was 12.16 (SD = 10.56; range = 0–45; $\alpha = .91$), and the spouse mean was 6.99 (SD = 6.17; range = 0–27; $\alpha = .83$). At T2, the patient mean was 13.20 (SD = 10.47; range = 0–48; $\alpha = .91$), and the spouse mean was 7.69 (SD = 6.44; range = 0–30; $\alpha = .83$). At T3, the patient mean was 12.53 (SD = 9.98; range = 0–44; $\alpha = .90$), and the spouse mean was 7.95 (SD = 6.95; range = 0–30; $\alpha = .87$). A score of 16 or higher on the CES-D generally is regarded as indicative of the possible presence of clinical depression. At T1, 23.5% of patients scored 16 or higher (33.0% at T2; 31.3% at T3), whereas 9.6% of spouses scored 16 or higher (13.9% at T2; 14.8% at T3).

Study Covariates

Demographics—Participants’ demographic characteristics were assessed at T1 (e.g., age). In addition, patients reported time (in years) since diabetes diagnosis and spouses reported years of marriage (See Table 1).

Patients’ Diet Adherence—At T2, patients and spouses reported on patients’ diet behavior over the previous seven days using a single item (i.e., On how many of the last seven days have you (your spouse) followed a healthful eating plan?) from the diet subscale of the Summary of Diabetes Self-Care Activities (SDSCA; Toobert, Hampson, & Glasgow,

2000). This single item was modified for spouses' reports. Responses could range from 0 to 7 days. The mean for patients was 5.16 (SD = 2.05; range = 0–7), and the mean for spouses was 5.10 (SD = 1.85; range = 0–7).

Analysis Plan

Hierarchical multiple regression analysis was used to examine anticipated associations of emotional distress with perceptions of patients' setbacks in diet adherence. Separate models were estimated to examine change in emotional distress (diabetes distress, depressive symptoms) of patients and spouses in the shorter-term (across six months), and to examine change in emotional distress of patients and spouses over the longer-term (across one year) yielding a total of eight models. We focused on actor effects (Kenny, Kashy, & Cook, 2006) in these models with *patients'* emotional distress regressed on their own reports of predictor variables except years married (reported by spouses), and *spouses'* emotional distress regressed on their own reports of predictor variables except diabetes duration (reported by patients). Further, in each analysis, one type of emotional distress (e.g., diabetes distress) was included as a covariate in the prediction of the other type of emotional distress (e.g., depressive symptoms) to adjust for the intercorrelation between these two indicators of emotional distress.

Our first set of four models explored change across six months from T1 to T2 (shorter-term change) in each type of emotional distress separately for patients and for spouses. For *diabetes distress* (at T2), analyses included baseline levels of *diabetes distress* (at T1), concurrent levels of depressive symptoms (at T2), additional covariates (i.e., age, gender, diabetes duration, years married, patients' diet adherence at T2), and our key predictor, patients' diet setbacks (at T2). For *depressive symptoms*, analyses included baseline levels of *depressive symptoms* (at T1), concurrent levels of diabetes distress (at T2), additional covariates (i.e., age, gender, diabetes duration, years married, patients' diet adherence at T2), and our key predictor, patients' diet setbacks (at T2).

Our second set of four models explored change across one year from T1 to T3 (longer-term change) in diabetes distress and depressive symptoms separately for patients and spouses. All predictors from our previous set of analyses were repeated in these analyses of longer-term change in emotional distress. Thus, each type of emotional distress (at T3) was regressed on initial levels of each outcome (diabetes distress or depressive symptoms at T1), the other outcome at T2, additional covariates, and patients' dietary setbacks (at T2).

Results

Before examining associations of patients' diet setbacks with emotional distress, frequency of patients' diet setbacks is described and bivariate associations among key study variables are presented. Nearly all patients (94%) reported that they had experienced setbacks in their diet management in the previous six months. Similarly, most spouses (88%) also reported that patients had experienced diet setbacks during this same time period. Moreover, many patients (68.7%) and spouses (69.9%) reported that the spouse tried to help their partners resume their dietary management when they were experiencing diet setbacks. Results of paired t-tests indicated that, on average, patients reported experiencing setbacks in their dietary management more often than did their spouses ($t(114) = 2.16, p < .05$). Patients' reports of their diet setbacks were associated positively with reports of their spouses ($r = .40$, see Table 2).

Next, we compared patients' and spouses' reports of emotional distress at T2 and T3 using paired t-tests. At T2, compared with their spouses, patients reported greater diabetes distress ($t(114) = 2.99, p < .01$) and greater depressive symptoms $t(114) = 5.34, p < .001$). This

pattern of findings also was detected at T3, with patients reporting greater diabetes distress ($t(114) = 2.65, p < .01$) and greater depressive symptoms ($t(114) = 4.98, p < .001$) than their spouses.

Associations among patients' and spouses' reports of each type of emotional distress across the three study time points are displayed in Table 2. Coefficients based on patients' reports are above the diagonal and those based on spouses' reports are below the diagonal. Associations between patients' and spouses' reports are on the diagonal. Notably, strong associations were detected between patients' diabetes distress and depressive symptoms at all three time points ($r = .66, r = .69, r = .67$, respectively). For spouses however, modest associations were detected between their diabetes distress and depressive symptoms at each of the three time points ($r = .30, r = .47, r = .46$, respectively).

Diet Setbacks and Shorter-Term Change in Emotional Distress

Results of regression analyses predicting change in patients' (and spouses') emotional distress in the shorter-term (over six months from T1 to T2) are shown in Table 3. As predicted, patients' reports of diet setbacks were associated with an increase in their diabetes distress ($\beta = .13, p < .05$). Patients' diet setbacks were related to change in their diabetes distress even when controlling for concurrent levels of their depressive symptoms (and other covariates). This finding increases confidence that detected change in patients' diabetes distress is associated with patients' diet setbacks independent from contemporaneous levels of patients' depressive symptoms. Contrary to our expectations, however, patients' diet setbacks were not significantly associated with their depressive symptoms ($\beta = -.03, ns$) after controlling for T2 diabetes distress and other covariates.

Next we examined change in spouses' emotional distress over six months (from T1 to T2). Spouses' reports of patients' diet setbacks were associated with increases in their diabetes distress ($\beta = .28, p < .001$) even after controlling for their T2 depressive symptoms and other covariates. Spouses' reports of patients' diet setbacks were not associated with shorter-term change in their depressive symptoms ($\beta = .03, ns$), however.

We further explored the possibility that each partner's report of diet setbacks may be associated with the emotional distress of the other (i.e., partner effects; analyses not shown). We repeated each of our models to include partners' report of T2 diet setbacks as a predictor of T2 diabetes distress or T2 depressive symptoms of their spouses. No partner effects were found. Specifically, no significant associations were found between one partner's report of diet setbacks and shorter-term change in emotional distress of her or his spouse.

Diet Setbacks and Longer-Term Change in Emotional Distress

Patients' diet setbacks were examined as a predictor of change in patients' emotional distress over the longer-term (over one year from T1 to T3). Contrary to our expectations, patients' reports of their diet setbacks at T2 were not significantly associated with increases in their emotional distress after controlling for other covariates in the respective models (see Table 4). Specifically, patients' diet setbacks were not associated with increases in their diabetes distress ($\beta = .03, ns$) or their depressive symptoms ($\beta = -.05, ns$) over the longer-term.

Next, spouses' reports of patients' diet setbacks were examined as a predictor of change in spouses' emotional distress over the longer-term (over one year from T1 to T3). In contrast to patients' reports, though as we anticipated, spouses' reports of patients' diet setbacks were associated with increases in spouses' own emotional distress over time. Specifically, spouses' reports of patients' diet setbacks were associated with increases in their diabetes

distress ($\beta = .30, p < .001$) and in their depressive symptoms ($\beta = .28, p < .01$) even after controlling for other covariates.

We again explored the possibility that each partner's report of diet setbacks may be associated with the emotional distress of the other (i.e., partner effects; analyses not shown). We repeated each of our models to include partners' report of T2 diet setbacks as a predictor of T3 diabetes distress or T3 depressive symptoms of their spouses. No partner effects were found. Specifically, no significant associations were found between one partner's report of diet setbacks and longer-term change in emotional distress of her or his spouse.

Discussion

Research that addresses emotional costs associated with chronic illness management of both patients and spouses is limited. We accordingly examined the association between patients' diet setbacks and change in diabetes-related distress and depressive symptoms among patients with diabetes and their spouses. Consistent with our expectation, patients' difficulties with dietary adherence (i.e., diet setbacks) were associated with increases in diabetes distress and depressive symptoms for patients and for spouses.

Difficulties in adhering to a recommended diet were commonly experienced by patients, with few patients reporting no setbacks in their diet management over a six month period. Patients' difficulties in diet management were echoed in the reports of their spouses, though patients reported that they experienced diet setbacks more often than did their spouses. Moreover, when patients were experiencing difficulties in managing their diet, approximately two-thirds of patients and spouses indicated that the spouse had attempted to aid the patient in resuming the diet regimen.

Diet Setbacks and Patients' Emotional Distress

A primary aim of our investigation was to examine the association of setbacks in patients' diet management with *change* in their diabetes distress and in their depressive symptoms. As anticipated, patients' reports of diet setbacks contributed to an increase in patients' diabetes distress in the shorter-term (over six months). That is, patients who reported more setbacks in their diet adherence during the previous six months had greater diabetes distress at T2, even when controlling for their concurrent reports of depressive symptoms. An association of diet setbacks with diabetes distress over one year was not detected, however. Moreover, diet setbacks were not associated with change in patients' depressive symptoms at either time point.

Diabetes distress and depressive symptoms experienced by patients often persist over time (Fisher et al., 2008), and thus it is not surprising that patients' reports of their diabetes distress were strongly correlated across the one-year study period as were their reports of depressive symptoms. Moreover, we found a consistent pattern linking patients' depressive symptoms with their diabetes-related distress. Specifically in each analysis, patients' depressive symptoms were linked with an increase in diabetes-related distress, and the reverse was also true that patients' diabetes-related distress was associated with an increase in their depressive symptoms. These findings suggest that distress related to diabetes co-occurs with general depressive symptoms, together detracting from the quality of life of patients with diabetes.

Contrary to our expectation, diet setbacks did not appear to generate lasting worry and concern among patients. Some patients with diabetes acknowledge "choosing to take a break" from the demands of their illness at times (Penckofer et al., 2007), and thus may not become concerned by lapses in their diet adherence. Instead, patients' emotional distress

may be elevated in response to perceptible changes in their physical functioning or disruption in their glycemic control more so than to variation in their behavioral adherence (Fisher et al., 2008; Talbot, Nouwen, Gingras, Bélanger, & Audet, 1999). It is also possible that patients' emotional distress in response to diet setbacks emerges slowly, over a longer period of time than the one-year period of the current study.

Diet Setbacks and Spouses' Emotional Distress

We also explored the association of patients' diet setbacks with diabetes distress and depressive symptoms of their spouses. Setbacks in patients' diet adherence were associated consistently with increases in emotional distress among spouses in our study, in line with our expectations. Specifically, spouses who perceived that their partner had experienced diet setbacks in the prior six months demonstrated elevated diabetes distress in both the shorter- and longer-term. Moreover, levels of depressive symptoms among these spouses also increased in the longer-term. These findings echo earlier research demonstrating that the demands of the illness context are not limited to patients alone but also extend to their spouses (Fisher et al., 2002; Franks et al., 2010; see also Berg & Upchurch, 2007).

The detected contribution of diet setbacks to change in emotional distress among spouses may reflect their distinctive standpoint in the management of diabetes. Spouses in our study frequently were identified as key collaborators in patients' efforts to resume proper dietary adherence following a significant lapse in their diet choices. In this way, patients' diet choices could be a readily observable signal to spouses that their partners are not properly managing their disease. Thus, what patients are (or are not) consuming may be among the most salient indicators shaping spouses' evaluation of their partners' success or failure in properly managing their diabetes, and thereby represent a primary source of concern and distress among spouses.

Our findings suggest the emotional impact of illness demands among spouses is not identical to that of patients. In particular, the contribution of each type of distress (e.g., depressive symptoms) to change in the other (e.g., diabetes distress) was not detected over the longer-term among spouses, as was the case among patients. This difference in partners' experiences of emotional distress over time underscores the need for couple- or family-based interventions to recognize and address the unique demands and sources of distress of spouses who share the disease context with their partners (Beverly et al., 2008; Fisher et al., 2002; White, Smith, & O'Dowd, 2007).

Limitations and Conclusions

Our study of emotional distress of patients and spouses in a diabetes context should be considered in light of its limitations. Foremost, although increases in diabetes distress and depressive symptoms were linked with patients' diet setbacks, our findings do not preclude a plausible reciprocal association between heightened emotional distress and patients' diet management. The potential for emotional distress to detract from patients' motivation and their persistence in adhering to their treatment regimen has been noted in several prior studies (e.g., Bell et al., 2010; Lin et al., 2004; Travis, 1997). Further, it is reasonable to also expect that spouses who harbor greater concerns and worries about their partners with diabetes may be more attentive to shortcomings in patients' adherence to diet recommendations.

Our study also may be limited by the strategy we used to assess setbacks in patients' diet management. First, our assessment of patients' diet setbacks required participants to recall the frequency of significant difficulties in adhering to diet recommendations over the prior six months. When diet setbacks occurred very early in this six-month timeframe, association

with patients' and spouses' reports of their current emotional distress may have diminished. Second, patients' and spouses' evaluation of setbacks in patients' diet management were based solely on their evaluations of difficulties in patients' diet behaviors in retrospect. It may be informative to consider these evaluations together with other assessments of variation in patients' dietary behavior, such as daily diet records. Patients' and spouses' reports of setbacks in patients' diet management were moderately associated, and patients reported that diet setbacks occurred more frequently in the past six months than did their spouses. Thus, it does not seem that patients were "hiding" struggles with their diet regimen or that worried spouses were inflating difficulties in patients' dietary adherence.

Our investigation reveals that the emotional sequelae of challenges in sustaining a healthful diet can reach beyond the ill partner to affect the spouse. When spouses observed their partners diverging from their diet regimen with unsound diet choices, they experienced heightened worry and concern that persisted across time. Notably however, diet setbacks were not consistently linked with subsequent emotional distress among patients. More research is needed to explore whether perceptions of personal control over one's dietary practices, even when such practices are suboptimal, may protect patients from lingering emotional distress. In other words, patients may consider lapses in their diet management to be liberating, fleeting, and reversible and thus, not a lasting threat to their overall disease management. Whereas, spouses may perceive the same poor diet choices as an ominous signal of sustained and perilous behaviors that place their partners at risk. Our findings underscore the need for greater attention to the impact of patients' adherence, and particularly their nonadherence, on the well-being of spouses in research and in practice. Recognition that the demands and challenges of disease management are shared in the interconnected lives of patients and their partners may aid health professionals in promoting adjustment of patients and their spouses to chronic illness.

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Table 1

Sample characteristics (N = 115 couples).

Variable	Patient	Spouse
	Mean (SD)	Mean (SD)
Age	66.03 (7.73)	66.35 (8.62)
Gender (% female)	51.3%	48.7%
Years of education	13.84 (2.43)	13.82 (2.40)
Ethnicity (% Caucasian)	78.3%	80.7%
Years since diagnosis	11.54 (9.36)	---
Self-rated health ^a	3.03 (.86)	3.39 (.85)
Years married	38.40 (13.24)	
Median household income	\$40,000–59,999	

Note: Sample size varies due to missing data.^aReports of self-rated health could range from 1 (poor) to 5 (excellent).

Table 2

Bivariate correlations among diet setbacks, diabetes distress and depressive symptoms (N = 115).

	1	2	3	4	5	6	7	8
1 T2 diet setbacks	0.40 ***	0.48***	0.49***	0.35***	0.37***	0.36***	0.24**	-0.59***
2 T1 diabetes distress	0.48***	0.17 ***	0.80***	0.69***	0.66***	0.56***	0.46***	-0.33***
3 T2 diabetes distress	0.58***	0.71***	0.29 ***	0.79***	0.64***	0.69***	0.52***	-0.34***
4 T3 diabetes distress	0.58***	0.68***	0.76***	0.23 *	0.58***	0.55***	0.67***	-0.21*
5 T1 depressive symptoms	0.23**	0.30***	0.37***	0.31***	0.18	0.73***	0.65***	-0.21*
6 T2 depressive symptoms	0.30***	0.35***	0.47***	0.35***	0.66***	0.21 *	0.63***	-0.25**
7 T3 depressive symptoms	0.36***	0.22*	0.32***	0.46***	0.52***	0.58***	0.36 ***	-0.06
8 T2 diet adherence	-0.63***	-0.39***	-0.41***	-0.41***	-0.23**	-0.23**	-0.19*	0.45 ***

Note: Coefficients above the diagonal are for patients' reports and coefficients below diagonal are for spouses' reports. Coefficients on the diagonal are associations between patients' and spouses' reports.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3

Predictors of emotional distress for time 2 (N = 112).

	Patient ^a		Spouse ^b	
	T2 Diabetes Distress	T2 Depressive Symptoms	T2 Diabetes Distress	T2 Depressive Symptoms
	β	β	β	β
T1 Diabetes distress	0.53 ***	--	0.52 ***	--
T1 Depressive symptoms	--	0.51 ***	--	0.58 ***
T2 Diabetes distress	--	0.33 ***	--	0.25 **
T2 Depressive symptoms	0.31 ***	--	0.20 **	--
Gender (1 = male)	0.07	0.04	-0.01	0.08
Age	0.05	0.04	0.11	-0.01
Years since diagnosis	0.02	0.09	-0.01	-0.04
Years married	-0.09	0.01	-0.11	0.04
T2 Diet adherence	-0.03	-0.08	-0.01	0.04
T2 Diet setbacks	0.13 *	-0.03	0.28 ***	0.03

Note.

^a All predictor and outcome variables reported by the patient except for years married.^b All predictor and outcome variables reported by the spouse except for years since diagnosis.* $p < .05$.** $p < .01$.*** $p < .001$.

Table 4

Predictors of emotional distress for time 3 (N = 112).

	Patient ^a		Spouse ^b	
	T3 Diabetes Distress	T3 Depressive Symptoms	T3 Diabetes Distress	T3 Depressive Symptoms
	β	β	β	β
T1 Diabetes distress	0.54 ***	--	0.50 ***	--
T1 Depressive symptoms	--	0.53 ***	--	0.46 ***
T2 Diabetes distress	--	0.33 ***	--	0.02
T2 Depressive symptoms	0.23 **	--	0.06	--
Gender (1 = male)	0.05	-0.01	0.01	0.03
Age	0.06	0.14	0.12	0.26 **
Years since diagnosis	0.04	-0.02	0.05	-0.05
Years married	-0.03	0.12	-0.09	-0.04
T2 Diet adherence	0.02	0.11	-0.04	0.08
T2 Diet setbacks	0.03	-0.05	0.30 ***	0.28 **

Note.

^a All predictor and outcome variables reported by the patient except for years married.^b All predictor and outcome variables reported by the spouse except for years since diagnosis.* $p < .05$.** $p < .01$.*** $p < .001$.