


Disease factors associated with spousal influence on diabetic diet: An exploratory comparison of Vietnamese American and White older adults

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Abstract

This study examined whether disease-specific factors were important for how and how often White versus Vietnamese American spouses influenced their partners' diabetic diet. Results from a cross-sectional survey of 145 older adult spouses whose partners had type 2 diabetes revealed that Vietnamese American spouses used more frequent spousal influence (positive and negative) than White spouses. In addition, most of the factors associated with spousal influence differed for Vietnamese American and White spouses. Findings from this study highlight the importance of proximal and sociocultural factors in understanding older spouses' influence on their partners' diabetic diet.

Keywords

diabetes, gender, health-related social control, race/ethnicity, social undermining

One in four older adults has type 2 diabetes (Centers for Disease Control and Prevention (CDC), 2017). Not only is the prevalence of diabetes higher among Vietnamese Americans than Whites (McNeely and Boyko, 2004) but rates of diabetes-related morbidities and mortality also are higher for Vietnamese Americans compared to Whites (e.g. Pugh et al., 1995). To reduce complications associated with uncontrolled diabetes for which older adults are at particular risk (Kirkman et al., 2012), patients must adhere to a number of prescribed health behaviors, including eating a healthy diet (American Diabetes Association (ADA), 2017). Adhering to a diet that promotes blood sugar control is reported to be among the most difficult aspects of diabetes management (Beverly et al., 2008), with correspondingly high rates of dietary nonadherence (Vijan et al., 2005).

Across races/ethnicities, spouses often serve as an important influence on their partners' diabetic diet (August & Sorkin, 2011; Trief et al., 2003). With some exceptions (e.g. Stephens et al., 2013), most of this literature has focused on spousal support (e.g. Beverly et al., 2008; Schokker et al., 2010; Trief et al., 2003). Yet, spouses not only encourage and provide positive feedback on their partners' dietary behaviors but also attempt to influence, or change, diet-related attitudes or behaviors. Furthermore,

most studies on spouses' involvement in their partners' chronic disease in general have used predominately White samples. Little is known about potential cultural differences in how spouses are involved in their partners' disease management, and even less is known about cultural differences in specific social processes, such as spousal influence attempts, in this context. Given that Vietnamese Americans are at particular risk for poor diabetes outcomes, efforts to understand these social processes among one of the fastest-growing Asian subgroup in the United States (US Census Bureau, 2012) are important for developing culturally appropriate interventions for patients and their families. This study accordingly sought to examine whether factors related to patients' diabetes were important for how and how often Vietnamese American versus White spouses attempted to influence their partners' diabetic diet.

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Spousal influence on their partners' diabetic diet

Spouses may attempt to positively influence their partners' dietary adherence by exerting *health-related social control*, which involves efforts to monitor and influence individuals to improve their health behaviors (e.g. eating a healthy diet; Lewis and Rook, 1999). Although the intention of social control may be to facilitate improved health behavior in the recipient (Hughes and Gove, 1981), whether control is actually health promoting depends, in part, on the type of strategy that is used. Two main strategies of social control have been distinguished in the literature (Lewis and Rook, 1999; Tucker et al., 2006). Positive health-related social control, or persuasion, refers to gentle reminders, expressions of worry, and other attempts at influence that tend to elicit positive emotions in the recipient (Stephens et al., 2009). Negative health-related social control, or pressure, refers to criticisms, restrictions of behavior, and other attempts at influence that tend to elicit negative emotions in the recipient (Stephens et al., 2009). Previous research has found both types of social control to be common among older couples managing a diabetic diet (Franks et al., 2012), although patients with diabetes report receiving (August and Sorkin, 2010) and nondiabetic spouses report using (Stephens et al., 2013) persuasion more frequently than pressure. The behavioral and emotional consequences of these types of social control are relatively well understood, with individuals typically responding more favorably to persuasion than pressure (August and Sorkin, 2010; Craddock et al., 2015; Stephens et al., 2009, 2013). Research has begun to examine the potential spousal and relational consequences associated with engaging in social control (August et al., 2011, 2013), but little is known about what factors are associated with the frequency in which spouses engage in different types of social control.

In addition to spousal efforts to promote dietary adherence by engaging in social control, spouses may detract from their partners' dietary adherence by engaging in *health-related social undermining*, which involves efforts to hinder individuals' goal of engaging in healthy behaviors (Gallant et al., 2007; Henry et al., 2013; Rosland et al., 2010). Compared to the intended health-promoting effects of social control, undermining may or may not be intended to be health-compromising (Gallant et al., 2007; Henry et al., 2013). Furthermore, undermining is less frequently used than social control in this context (Gallant et al., 2007; Henry et al., 2013), as spouses and their partners often have the shared goal of adherence to a chronic disease regimen (Berg and Upchurch, 2007). Undermining nonetheless may interfere with patients' efforts to adhere to their prescribed dietary regimen (Henry et al., 2013; Sorkin et al., 2014). Although undermining has not been extensively studied in the context of chronic disease management, Henry et al. (2013) distinguished between two types of undermining

specific to a diabetic diet. The first type, tempting, refers to attempts to encourage unhealthy behaviors, such as tempting a partner to eat foods that are not part of a prescribed dietary regimen. The second type, disregard, refers to attempts to discourage healthy behaviors, such as downplaying the importance of a diabetic diet. Similar to the literature on strategies of social control, these two types of negative influence have been shown to be differentially associated with recipient outcomes, with tempting being related to dietary nonadherence and disregard being related to nonadherence to other components of a diabetic regimen (Henry et al., 2013). Compared to the literature on social control, even less is known about what factors are associated with the frequency in which spouses engage in different types of undermining.

Factors related to spousal influence

Although some research has focused on factors associated with providing social support to an individual in need (see Dunkel-Schetter and Skokan, 1990) including patients with diabetes (Iida et al., 2010), little is known about factors that might be associated with spousal influence. Berg and Upchurch (2007) discuss the importance of contextual factors in couples' management of chronic disease; specifically, they note the importance of proximal contextual factors, including characteristics of the disease itself, as well as sociocultural factors, including race/ethnicity. Building on this framework, this study sought to understand how disease factors are associated with how frequently spouses use different types of dietary influence and how these associations may differ as a function of race/ethnicity.

Disease factors. The length of time couples are managing diabetes may have an impact on what type and how frequent spousal influence attempts are. When couples are coping with a recent diagnosis, more positive spousal involvement may be necessary to ensure adherence to a newly prescribed dietary regimen (Trief et al., 2003). At the same time, spouses may be more likely to undermine their partners' efforts to follow their dietary regimen, because both partners may still be adapting to a newly prescribed regimen that requires redistribution of household responsibilities and changes to established patterns of behavior that may challenge continual adherence (Franks et al., 2016; Lewis et al., 2006).

In addition to an objective factor such as time since diagnosis, spouses' perceptions of how their partners are managing or coping with their disease may be important to consider with regard to how and how often spouses engage in behaviors to influence their partners' diabetic diet. Specifically, the extent to which spouses perceive their partners to already be following a diet consistent with their prescribed regimen may be related to spousal influence attempts. Social control has been posited to

occur when individuals require assistance with self-regulating their own health behaviors (Hughes and Gove, 1981; Lewis and Rook, 1999). Thus, when patients are engaging in poor dietary behaviors, spouses would be more likely to exert social control in an attempt to improve their dietary behaviors; in contrast, if patients are already engaging in healthy dietary behaviors, spouses may not feel a need to engage in such attempts. Whether spouses' perceptions of their partners' dietary behaviors are related to spousal undermining is less clear. For example, tempting may occur in response to patients who already may be engaging in healthy dietary behaviors, but are offered forbidden food in an attempt to provide comfort or other positive emotions this food may elicit, or to make the patient feel included in family celebrations that involve food (Chesla and Chun, 2005; Henry et al., 2013; Wong et al., 2005). Disregard, in contrast, may occur in response to spouses' frustration with their partners' lack of effort in self-regulating their own dietary behaviors (Henry et al., 2013). Spouses may not want to be burdened or stressed with the sole responsibility of making sure their partners are adhering to their diabetic diet (August et al., 2011, 2013) so they may disregard their partners' diet.

The extent to which spouses perceive their partners to be worried about their diabetes also may play a role how and how often spouses influence their partners' behaviors. Research suggests that many patients and their spouses worry about diabetic complications and experience anxiety as a result (Fisher et al., 2002; Polonsky et al., 1995). These worries may motivate spouses to ensure their partners are properly adhering to their prescribed regimen by engaging in more spousal control and less spousal undermining.

Sociocultural contextual factors. Not only is the proximal context important to consider in understanding spousal influence but the sociocultural context in which this type of involvement occurs also warrants consideration (Berg and Upchurch, 2007; Revenson, 2003). Although a majority of married patients from different racial/ethnic backgrounds identify their spouses as playing an integral role in their diabetes management (August and Sorkin, 2011), racial/ethnic differences in the marital processes (McLoyd et al., 2000), couples' management of chronic disease (Gallant et al., 2010), social influence of health behaviors (Gallant et al., 2007), and dietary beliefs and practices (Tripp-Reimer et al., 2001) suggest that there also may be racial/ethnic differences in factors associated with how and how often spouses attempt to influence their partner's diabetic diet.

Vietnamese Americans are a unique Asian subgroup in which to examine differences from Whites in the social influence processes involved in diabetes management. In addition to experiencing higher rates of diabetes and worse overall health than Whites (e.g. Sorkin et al., 2008), some Vietnamese Americans have beliefs about diabetes management that are inconsistent with Western culture (Ahn

et al., 2003; Nguyen, 2014). Furthermore, norms for spousal involvement may differ as a function of broad cultural differences between individuals from collectivistic and individualistic cultures (Cross and Madson, 1997; Triandis, 2001). Little is known, however, about health-related interactions involved in everyday disease management among Vietnamese Americans—a fast growing, yet understudied, minority.

This study

Most studies to date have focused on how spouses support (not influence) their partners' health behaviors in the context of chronic disease management. The evidence that is available about spousal influence on health behaviors is focused mainly on implications for patients, and most research to date has only examined social influence processes using predominately White samples. Given the importance of proximal and sociocultural contextual factors for spousal involvement in disease management (Berg and Upchurch, 2007), this study sought to examine the role of disease (proximal) factors in spousal influence and whether these factors differed for Vietnamese American and White older adults (sociocultural).

First, we predicted that Vietnamese American spouses would engage in more frequent social control than White spouses. We did not have any specific predictions about racial/ethnic differences in the frequency of spousal undermining, however, given how few studies have examined this type of influence. Second, we predicted that spouses whose partners had been diagnosed with diabetes for a shorter period of time would engage in more frequent spousal control and undermining. Third, we predicted that spouses who perceived their partners to be engaging in healthier dietary behaviors would engage in less frequent spousal control (both types), more frequent tempting, and less frequent disregard. Fourth, we predicted that spouses who perceived their partners to have greater diabetes worries would engage in more frequent social control and less frequent undermining. We sought to examine whether all of these associations differed for Vietnamese American and White spouses.

In addition to race/ethnicity, another sociocultural factor important for understanding couples' management of chronic disease is gender. Gender differences in overall spousal involvement in a partner's disease management (Revenson, 2003), as well as in social influence attempts, in particular (August and Sorkin, 2010; Rook et al., 2011; Rosland et al., 2010) have been identified in the literature. Many of the previous findings related to gender are based on mostly White samples, however, and thus little is known whether gender differences in this type of spousal involvement extend to individuals of other races/ethnicities, such as Vietnamese Americans. Given the small sample size of men and women from each race/ethnicity in this study, gender is examined as an exploratory moderator.

Method

Participants

Participants included 145 nondiabetic spouses over the age of 55 years whose partners had a diagnosis of type 2 diabetes. Participants for this study included White ($n = 33$ male, 53 female) and Vietnamese American ($n = 37$ male, 22 female) spouses. A majority (86.2%) of Vietnamese Americans were born outside of the United States, compared to 13.8 percent of Whites.

Procedure

Patients were recruited in 2006 and 2007 from primary care and endocrinology clinics where they received their primary diabetes care. Eligibility criteria for patients consisted of being diagnosed with type 2 diabetes and having had at least one visit with a physician in the 2 years prior to the study. Married patients who provided written consent were asked to provide their spouses with a self-report questionnaire to complete at home and send back in a pre-paid, stamped envelope. Spouses' compensation for participation included a US\$10 gift card. Approval for the project was provided by a university-specific Institutional Review Board (See Kaplan et al. (2013) for additional patient study details).

Measures

All survey questions were provided in English and Vietnamese. Items were tested for cultural and linguistic equivalency through focus groups with native speakers, as well as forward and back translation (Fowler, 1992).

Time since diabetes diagnosis. To assess time since diagnosis (in years), patients were asked, "How long have you had diabetes?" This value was subtracted from the year of data collection.

Spouses' perceptions of their partners' dietary behaviors. To assess spouses' perceptions of patients' dietary behaviors important for diabetes management, six items were adapted from the Kristal Fat and Fiber Behavior Questionnaire (Shannon et al., 1997). Spouses rated on a 4-point scale how often in the past week their partners ate low-sugar, low-fat diets (1 = rarely/none of the time (<1 day), 4 = most or all of the time (5-7 days)). A sample item included, "Eat foods high in sugar (such as candy, fruit juice, cookies, tea or coffee flavored with sugar)." The items were reverse coded and averaged to create a composite measure of healthy dietary behaviors ($\alpha = .81$).

Spouses' perceptions of patients' diabetes worries. To assess spouses' perceptions of their partners' worries, seven items were adapted from the Patient Outcome Research Team study (Greenfield et al., 1994). Spouses rated on a 5-point

scale the extent to which they thought their partners were worried or concerned about complications that may develop from diabetes (1 = not at all worried, 5 = extremely worried). A sample item included "Dying earlier than most people because of diabetes." The items were averaged to create a composite measure of diabetes worries ($\alpha = .95$).

Spousal control (persuasion and pressure). To assess spousal control of dietary behaviors, items were adapted from Stephens et al. (2009). Spouses rated on a 6-point scale how often they engaged in control attempts directed toward their partner in the past month (1 = not at all, 6 = every day). Items were averaged to create composite measures. Three items assessed persuasion; a sample item included: "let your spouse know that his or her poor food choices worry you" ($\alpha = .91$). Four items assessed pressure; a sample item included: "express irritation with your spouse's poor food choices" ($\alpha = .85$).

Spousal undermining (tempting and disregard). To assess spousal undermining of dietary behaviors, items were adapted from Henry et al. (2013). Spouses rated on a 6-point scale how often they engaged in undermining attempts directed toward their partner in the past month (1 = not at all, 6 = every day). One item assessed tempting: "tempt your spouse to eat foods not on his/her diabetic diet?" Two items assessed disregard for diabetic diet: "show that you did not care about how well your spouse followed his/her diabetic diet?" and "show that you did not think your spouse's diabetic diet was important." These items were averaged to create a composite measure of disregard ($r = .75, p < .001$).

Race/ethnicity. Spouses' race/ethnicity was coded as 0 = White, 1 = Vietnamese American.

Gender. Spouses' gender was coded as 0 = male, 1 = female.

Covariate selection. The following covariates initially were chosen a priori based on the literature suggesting that these factors are important for spousal involvement in disease management: spouses' age, spouses' education level (dichotomized at the approximate median split, 0 = high school or less, 1 = some college or more), marital length, spouses' perceived marital quality (average of five items adapted from the Marital Quality Index; Norton, 1983), and patients' total illness burden (composite measure of chronic health conditions using a modified version of the Total Illness Burden Index; Greenfield et al., 2010). Only spouses' education level was included as a covariate in final analyses because it had a significant (negative) bivariate association with spousal persuasion, pressure, and disregard.

Analytic plan. All analyses were conducted using SPSS v24. No key variables had more than 5 percent data missing (except time since diagnosis, which had 13.3% missing data); missing data were excluded from analyses

Table 1. Participant characteristics ($N = 145$).

| | Range | White ($n = 86$) | | Vietnamese American ($n = 59$) | |
|--|--------|--------------------|--------------------|----------------------------------|--------------------|
| | | Men ($n = 33$) | Women ($n = 53$) | Men ($n = 37$) | Women ($n = 22$) |
| Age (years) ^a | 55–91 | 65.30 (7.13) | 65.11 (6.94) | 71.59 (7.41) | 66.86 (6.19) |
| Education level (years) ^{a,b} | 3–17 | 15.48 (2.14) | 15.13 (1.70) | 12.20 (3.02) | 9.95 (3.41) |
| Length of marriage (years) ^a | 3–65 | 33.68 (15.24) | 35.48 (14.04) | 45.14 (8.93) | 41.85 (14.06) |
| Marital quality ^a | 1–6 | 5.56 (0.55) | 5.50 (0.70) | 5.17 (0.82) | 5.18 (1.42) |
| Time since patient diagnosis (years) | 0.5–30 | 9.26 (6.33) | 9.50 (7.34) | 8.96 (5.84) | 10.55 (8.21) |
| Patients' worries about complications | 1–5 | 2.75 (1.04) | 2.46 (1.03) | 3.04 (1.10) | 2.70 (1.06) |
| Patients' dietary adherence ^a | 1–4 | 3.41 (0.62) | 3.19 (0.59) | 3.63 (0.54) | 3.48 (0.52) |
| SC: persuasion ^{a,b} | 1–6 | 2.70 (1.60) | 3.85 (1.55) | 4.68 (1.50) | 4.76 (1.45) |
| SC: pressure ^a | 1–6 | 1.92 (1.40) | 2.55 (1.37) | 3.02 (1.76) | 2.99 (1.71) |
| UN: tempting | 1–6 | 1.58 (1.03) | 1.48 (0.90) | 1.68 (1.56) | 1.81 (1.53) |
| UN: disregard ^a | 1–6 | 1.29 (0.96) | 1.14 (0.61) | 2.29 (1.76) | 2.26 (1.93) |

SC: social control; UN: undermining.

All variables are from spouse reports except time since diagnosis. Table entries are unadjusted mean values (standard deviations). p -values were sequentially corrected according to Holm (1979). All race/ethnicity \times gender interactions were nonsignificant.

^aSignificant racial/ethnic differences at $p \leq .02$.

^bSignificant gender differences at $p \leq .01$.

using listwise deletion. To examine racial/ethnic and gender differences in key study variables, we conducted two-way analyses of variance (ANOVAs). To account for unbalanced data, we used type 2 sums of squares (Langsrud, 2003); to account for multiple comparisons, we made a Holm–Bonferroni sequential correction to p -values (Holm, 1979).

To test our study hypotheses, we conducted four multi-variable linear regression analyses. We included all of the disease factors in the same regression to determine the extent to which each disease factor was related to social influence while controlling for the other factors. We entered variables in the following stepwise order: main effects of spouses' education as a covariate, disease factors (time since diagnosis, spouses' perceptions of patients' dietary behaviors, and spouses' perceptions of patients' diabetes worries), race/ethnicity, and gender (Step 1); three two-way interactions between each disease factor and gender, three two-way interactions between each disease factor and race/ethnicity, and the interaction between race/ethnicity and gender (Step 2); and three three-way interactions between each disease factor, race/ethnicity, and gender (Step 3). We probed significant interactions by calculating simple slopes at $-1/+1$ standard deviation (SD) of the mean for the independent variable and for each race/ethnicity and/or gender.

Results

Participant characteristics

Table 1 presents the results of two-way ANOVAs that tested racial/ethnic and gender differences in sociodemographic characteristics and key study variables. Compared to White spouses, Vietnamese American spouses were significantly older ($F(1, 141) = 11.59, p = .001, \eta_p^2 = 7.59\%$) and less educated ($F(1, 138) = 91.82, p < .001, \eta_p^2 = 39.95\%$), married significantly longer ($F(1,$

138) = 15.28, $p < .001, \eta_p^2 = 9.97\%$), reported significantly lower marital quality ($F(1, 137) = 5.50, p = .02, \eta_p^2 = 3.86\%$), and perceived their partners to be eating a healthy diet significantly more frequently ($F(1, 136) = 6.06, p = .015, \eta_p^2 = 4.27\%$). Vietnamese American spouses also engaged in significantly more frequent persuasion ($F(1, 135) = 29.49, p < .001, \eta_p^2 = 17.93\%$), pressure ($F(1, 138) = 8.38, p = .004, \eta_p^2 = 5.73\%$), and disregard ($F(1, 136) = 20.90, p < .001, \eta_p^2 = 13.32\%$) than White spouses. Two significant gender differences also emerged. Specifically, compared to male spouses, female spouses were significantly less educated ($F(1, 138) = 40.20, p = .01, \eta_p^2 = 4.97\%$) and engaged in more frequent persuasion ($F(1, 135) = 6.86, p = .01, \eta_p^2 = 4.84\%$). There were no significant racial/ethnic or gender differences in time since diagnosis, spouses' perceptions of patient worries, or spousal tempting, nor were there any significant racial/ethnic by gender interactions in any of the variables examined.

Finally, results from paired t -tests revealed that persuasion was the most frequently used type of spousal influence, followed by pressure, disregard, and tempting being the least frequently used type of spousal influence (t s ranged from 6.64 to 14.42, all $ps < .001$).

Hypotheses tests

Factors associated with spousal control. In examining predictors of spousal persuasion, there were two significant interactions with race/ethnicity: one between dietary behaviors and race/ethnicity and one between diabetes worries and race/ethnicity (Table 2). Specifically, Vietnamese American spouses who perceived their partners to eat a healthy diet more frequently engaged in more frequent persuasion than Vietnamese American spouses who perceived their partners to eat a healthy diet less frequently (b (standard

Table 2. Factors associated with spousal control ($N = 145$).

| | Persuasion | | | Pressure | | |
|----------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| Education | 0.07 (0.39) | -0.06 (0.39) | -0.09 (0.39) | -0.12 (0.40) | -0.19 (0.43) | -0.18 (0.43) |
| Race/ethnicity (R/E) | 1.43 (0.40)* | 1.77 (0.47)*** | 1.69 (0.49)** | 0.60 (0.41) | 0.70 (0.52) | 0.72 (0.53) |
| Gender (G) | 0.90 (0.30)* | 1.40 (0.38)*** | 1.46 (0.38)*** | 0.42 (0.30) | 0.57 (0.39) | 0.56 (0.38) |
| Time since diagnosis (TSD) | -0.02 (0.02) | -0.01 (0.04) | -0.03 (0.05) | 0.02 (0.02) | 0.04 (0.04) | -0.02 (0.05) |
| Dietary behaviors (DB) | -0.03 (0.25) | -0.32 (0.42) | -0.64 (0.48) | -0.22 (0.24) | -0.33 (0.45) | -0.52 (0.51) |
| Diabetes worries (DW) | 0.36 (0.14)* | 0.64 (0.25)* | 0.41 (0.32) | 0.41 (0.13)* | 0.37 (0.26) | 0.26 (0.32) |
| R/E × G | | -1.10 (0.61) | -0.98 (0.62) | | -0.35 (0.65) | -0.19 (0.64) |
| TSD × R/E | | 0.01 (0.04) | 0.06 (0.07) | | -0.03 (0.05) | 0.10 (0.07) |
| TSD × G | | -0.01 (0.04) | 0.02 (0.06) | | -0.01 (0.05) | 0.07 (0.06) |
| DB × R/E | | 1.49 (0.54)** | 2.09 (0.73)** | | 0.53 (0.58) | 0.97 (0.78) |
| DB × G | | -0.20 (0.49) | 0.25 (0.61) | | -0.15 (0.52) | 0.11 (0.64) |
| DW × R/E | | -0.79 (0.28)** | -0.52 (0.41) | | -0.05 (0.29) | -0.05 (0.42) |
| DW × G | | 0.05 (0.28) | 0.35 (0.39) | | 0.09 (0.29) | 0.14 (0.39) |
| TSD × R/E × G | | | -0.10 (0.09) | | | -0.21 (0.09)* |
| DB × R/E × G | | | -1.31 (1.09) | | | -1.18 (1.14) |
| DW × R/E × G | | | -0.48 (0.56) | | | 0.05 (0.58) |
| | Adjusted $R^2 = .20$ | Adjusted $R^2 = .29$ | Adjusted $R^2 = .29$ | Adjusted $R^2 = .15$ | Adjusted $R^2 = .17$ | Adjusted $R^2 = .22$ |

All values reported are unstandardized regression coefficients (standard error). Model 1 = main effects; model 2 = two-way interactions; model 3 = three-way interactions. For race/ethnicity, 1 = Vietnamese American; for gender 1 = women. All variables are from spouse reports except time since diagnosis.

* $p < .05$; ** $p < .01$; *** $p < .001$.

error (SE)) = 1.03 (0.43), $t = 2.34$, $p = .04$); the simple slopes were not significant for White spouses. In addition, White spouses who perceived their partners to have more diabetes worries engaged in more frequent persuasion than White spouses who perceived their partners to have less diabetes worries ($b(SE) = 0.64 (0.18)$, $t = 3.49$, $p = .01$); the simple slopes were not significant for Vietnamese American spouses.

In examining predictors of spousal pressure, there was one significant main effect: Spouses' who perceived their partners to have more diabetes worries engaged in more frequent pressure ($\beta = .29$, $p = .002$). There was also a significant 3-way interaction between time since diabetes diagnosis, race/ethnicity, and gender ($\beta = -.43$, $p = .02$). None of the simple slopes for each of the race/ethnicity and gender pairs were significant, however.

Factors associated with spousal undermining. In examining predictors of spousal tempting, there was one significant effect: a three-way interaction between diabetes worries, race/ethnicity, and gender (Table 3). Only the simple slope for Vietnamese American female spouses was significant ($b(SE) = 0.73 (0.25)$, $t = 2.92$, $p = .01$), although the simple slope for Vietnamese American male spouses was marginally significant ($b(SE) = -0.40 (0.20)$, $t = 2.02$, $p = .07$). Specifically, Vietnamese American female spouses who perceived their partners to have more diabetes worries engaged in *more* tempting than Vietnamese

American female spouses who perceived their partners to have less diabetes worries; in contrast, Vietnamese American male spouses who perceived their partners to have more diabetes worries engaged in (marginally) *less* tempting than Vietnamese American male spouses who perceived their partners to have less diabetes worries.

In examining predictors of spousal disregard, there was one significant main effect: spouses who perceived their partners to have more diabetes worries engaged in more frequent disregard ($\beta = .18$, $p = .04$). One significant three-way interaction also emerged between time since diabetes diagnosis, race/ethnicity, and gender. Only the simple slope for Vietnamese American male spouses was significant ($b(SE) = 0.13 (0.04)$, $t = 3.24$, $p = .007$), although the simple slope for White female spouses was marginally significant ($b(SE) = 0.03 (0.01)$, $t = 2.10$, $p = .06$). Specifically, Vietnamese American male and White female spouses whose partners had diabetes for a longer period of time engaged in more frequent spousal disregard than Vietnamese American male and White female spouses whose partners had diabetes for a shorter period of time.

Discussion

Older Vietnamese American and White spouses are frequently involved in their partners' diabetic diet, yet more needs to be understood about factors related to whether they promote or detract from their partners' dietary

Table 3. Factors associated with spousal undermining (N = 145).

| | Tempting | | | Disregard | | |
|----------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| Education | 0.11 (0.32) | 0.07 (0.34) | 0.17 (0.33) | -0.17 (0.36) | -0.09 (0.37) | 0.06 (0.36) |
| Race/ethnicity (R/E) | 0.28 (0.33) | 0.36 (0.40) | 0.51 (0.41) | 0.99 (0.36)** | 1.01 (0.44)* | 1.27 (0.44)** |
| Gender (G) | 0.02 (0.24) | 0.05 (0.30) | 0.01 (0.30) | 0.12 (0.26) | 0.02 (0.33) | -0.06 (0.32) |
| Time since diagnosis (TSD) | -0.01 (0.02) | <-0.01 (0.03) | -0.02 (0.04) | 0.01 (0.02) | 0.05 (0.04) | -0.01 (0.04) |
| Dietary behaviors (DB) | 0.03 (0.19) | -0.22 (0.35) | -0.11 (0.40) | 0.03 (0.22) | -0.20 (0.38) | 0.13 (0.43) |
| Diabetes worries (DW) | 0.08 (0.10) | -0.24 (0.21) | 0.02 (0.25) | 0.24 (0.12)* | -0.17 (0.23) | -0.01 (0.27) |
| R/E × G | | -0.11 (0.50) | -0.06 (0.50) | | 0.21 (0.55) | 0.23 (0.54) |
| TSD × R/E | | -0.04 (0.04) | 0.03 (0.06) | | -0.01 (0.04) | 0.15 (0.06)* |
| TSD × G | | 0.01 (0.04) | 0.04 (0.05) | | -0.06 (0.04) | 0.04 (0.05) |
| DB × R/E | | 0.05 (0.45) | 0.18 (0.60) | | -0.36 (0.50) | -0.94 (0.66) |
| DB × G | | 0.30 (0.41) | 0.24 (0.49) | | 0.40 (0.45) | -0.07 (0.53) |
| DW × R/E | | 0.11 (0.23) | -0.43 (0.33) | | 0.49 (0.26) | 0.19 (0.36) |
| DW × G | | 0.50 (0.22)* | 0.07 (0.30) | | 0.44 (0.25) | 0.15 (0.33) |
| TSD × R/E × G | | | -0.12 (0.07) | | | -0.24 (0.08)** |
| DB × R/E × G | | | -0.66 (0.88) | | | 0.84 (0.96) |
| DW × R/E × G | | | 1.04 (0.45)* | | | 0.54 (0.49) |
| | Adjusted R ² = .03 | Adjusted R ² = .03 | Adjusted R ² = .03 | Adjusted R ² = .21 | Adjusted R ² = .28 | Adjusted R ² = .36 |

All values reported are unstandardized regression coefficients (standard error). Model 1 = main effects; model 2 = two-way interactions; model 3 = three-way interactions. For race/ethnicity, 1 = Vietnamese American; for gender, 1 = women. All variables are from spouse reports except time since diagnosis.

* $p < .05$; ** $p < .01$.

adherence in other ways besides providing support. Given the importance of both proximal and sociocultural contextual factors in couples' coping of a chronic disease such as diabetes (Berg and Upchurch, 2007), this study examined whether disease factors associated with how frequently spouses engaged in different types of influence on their partners' diabetic diet differed for older Vietnamese American and White men and women.

Spousal influence on their partners' diabetic diet

Among all spouses, spousal control was used more frequently than spousal undermining, suggesting that spouses in general do not want to engage in behaviors that challenge their shared goal with their partners of adhering to a prescribed dietary regimen (Berg and Upchurch, 2007). There were racial/ethnic differences in how frequently spouses engaged in most types of spousal influence and a gender difference in how frequency spouses engaged in persuasion.

Spousal control. The finding that Vietnamese American spouses engaged in more frequent persuasion than White spouses may reflect expectations among individuals from interdependent cultures that spouses are more likely to be more involved in their partners' disease management than individuals from independent cultures (Berg and Upchurch, 2007). The behaviors used to persuade partners to change their dietary behaviors, such as spouses trying

to do something to improve their partners' diet, are more consistent with dyadic forms of coping that are more common in Asian than Western cultures (Lyons et al., 1998).

Like Vietnamese Americans, women have interdependent self-representations (Cross and Madson, 1997), and also like Vietnamese Americans, they engaged in more frequent persuasion than male spouses. This finding is consistent with previous studies that focus on recipient reports of social control (e.g. August and Sorkin, 2010). Two possible reasons may account for why this gender difference is seen in persuasion (but not pressure). First, the older women in this study are more likely to adhere to traditional gender roles by being responsible for planning and preparing meals (Trief et al., 2003); this role may allow women to more easily persuade their husbands to eat a healthy diet. Second, female spouses may be better able than male spouses to calibrate their strategies to use ones that are more commonly associated with positive emotional responses in their partners (e.g. persuasion; Stephens et al., 2013), as women tend to be more aware of their spouses' emotional experiences than men (Kiecolt-Glaser and Newton, 2001).

Spousal undermining. The finding that Vietnamese American spouses engaged in more frequent disregard than White spouses could reflect the idea that the diabetic diet is incompatible with some of the common dietary habits of Vietnamese Americans that include high-glucose

starches (e.g. white rice; Nguyen, 2014). Vietnamese American spouses who do not have diabetes themselves may prefer to prepare and eat some of these commonly consumed foods (Nguyen, 2014) for themselves and others family members likely in the household (McLoyd et al., 2000). These efforts may be reflected in the extent to which they report showing their partners that they care about or think their diabetic diet is important.

Factors related to spousal influence

In addition to racial/ethnic and gender differences in the frequency of spousal influence, the sociocultural context played a role in which disease factors were related to different types of spousal influence.

Spousal control. The factors related to persuasion differed for Vietnamese American and White spouses. For Vietnamese American spouses, perceiving their partners to be eating a healthy diet more frequently was related to more frequent persuasion. This finding is contrary to expectations and inconsistent with the idea that social control is exerted in response to individuals' unsuccessful efforts at self-regulation (Hughes and Gove, 1981; Lewis and Rook, 1999). This finding could be the result of the cross-sectional nature of the study design, however, and reflect the opposite direction of hypothesized effects, in which recipient reports of persuasion are associated with eating a healthy diet more frequently (August and Sorokin, 2010). Specifically, it is possible that Vietnamese American spouses' previous efforts at persuasion may have been effective (August and Sorokin, 2011), resulting in spouses perceiving their partners to be engaging in healthy dietary behaviors.

For White spouses, perceiving their partners to have more diabetes worries was associated with more frequent persuasion. These spouses may attempt to allay their partners' worries by engaging in efforts to persuade their partners into eating a healthier diet. Similar to findings for White spouses, more diabetes worries were related to more frequent spousal pressure among all spouses. One possible reason spouses' worries were not predictive of Vietnamese American spouses' efforts to use persuasion may reflect the difference in emotional expressiveness among Vietnamese Americans compared to Whites (Kim et al., 2008), making it less likely that Vietnamese American patients' worries are expressed in interactions with their spouses. When patients' worries are visible, then they may be viewed by spouses as particularly serious and prompt spouses to use more heavy-handed influence attempts (i.e. pressure) to improve their partners' diet and lessen their partners' worries.

Finally, contrary to expectations, time since diagnosis was not related to frequency of spousal control, suggesting that spouses may engage in social control at the relatively same frequency regardless of when their partners were diagnosed.

Spousal undermining. Contrary to expectations, Vietnamese American male and White female spouses whose partners had been diagnosed with diabetes for a shorter period of time engaged in less frequent disregard. These spouses may be particularly vigilant in their efforts to avoid engaging in behaviors that show disregard for their partners' diet at a time when symptoms may not be well-controlled and the importance of the diet is communicated by more than one health care provider patients are likely to see early in their disease course. It is unclear why this objective disease factor was not related to the frequency of Vietnamese American female and White male spouses' disregard, however, and would need to be replicated in a larger sample to increase confidence in its validity.

Spouses' perceptions of their partners' worries were important for undermining, although most of the findings were not in the direction that was expected. One unexpected finding was that all spouses who perceived their partners to have more diabetes worries engaged in more frequent disregard. Perhaps, in attempting to assuage their partners' concerns about diabetes complications, spouses may downplay the importance of dietary behaviors in successful diabetes management. Instead, spouses may stress the importance of other more "medical" self-care behaviors (e.g. taking medication/insulin) that patients find easier to engage in (Beverly et al., 2008) and are more adherent to (Glasgow et al., 1987).

Spouses' perceptions of their partners' worries also were important for spousal tempting, but only among Vietnamese American spouses. Specifically, Vietnamese American female spouses who perceived their partners to have more diabetes worries engaged in *more* tempting; in contrast, Vietnamese American male spouses who perceived their partners to have more diabetes worries engaged in *less* tempting. This finding may be partially explained by gender differences in the relative use of coping strategies (Tamres et al., 2002). Vietnamese American female spouses may be more likely to use an emotion-focused coping strategy of preparing and offering forbidden food in response to perceiving their husband's worries. Vietnamese American male spouses, however, may be more likely to use a problem-focused coping strategy of not tempting their partners to eat foods that they believe may lead to more health issues (Nguyen, 2014). It is unclear why this same effect is not seen among White spouses, although these findings for tempting should be interpreted with caution, as only a very small proportion of variance (3%) is explained by all variables in the model, and tempting was the least frequently reported influence attempt in this study.

Finally, contrary to expectations, spouses' perceptions of their partners' dietary behaviors were not related to spousal undermining (tempting or disregard), suggesting that spouses may engage in undermining regardless of how well patients are adhering to their diet.

Taken together, the findings from this study suggest that health-promoting and health-compromising influence on dietary behaviors occur at different frequencies and for potentially different reasons among spouses from different races/ethnicities (and in some cases, genders). Spouses' perceptions of their partners' worries seem particularly important for spousal influence attempts.

Limitations and future directions

In evaluating the findings from this study, some limitations should be noted. First, because the results from this study are cross-sectional, we are unable to determine the temporal order of effects or predict change over time. Although we posited that subjective disease factors, such as perceptions of dietary adherence and diabetes worries, may prompt spouses to engage in influence attempts, there is likely to be a bidirectional association between spousal influence and these factors (e.g. Franks et al., 2012; Stephens et al., 2013). Future studies should examine these patterns longitudinally, as well as use experience sampling methodologies in an attempt to determine the directionality of findings. An additional limitation is the small number of items used to assess spousal undermining, and the low frequency of undermining (both types) spouses reported. It is possible, however, that there are less varied (and less frequent) spousal efforts to undermine a partner's diet than there are to control it. Another limitation is the small sample size, with few Vietnamese American female spouses, in particular. Although the findings from this study provide preliminary evidence about social influence among male and female spouses from two different cultures, they would need to be replicated with a larger sample size to enhance their validity. In a related vein, a more in-depth understanding of spousal influence in this context among individuals from racial/ethnic minority groups who are at a high risk for diabetes (CDC, 2017) is an important next step for research. Finally, these findings cannot be generalized to individuals with type 1 diabetes, who likely have been diagnosed for a longer period of time and require the use of insulin as part of their self-management regimen (ADA, 2017); thus, an examination of the reasons for how and how much spouses are involved in type 1 diabetes management is another important direction for future research.

Despite these limitations, the results from this study add to the literature on health-related spousal influence in the context of disease management and underscore the importance of examining cultural differences in these social processes. Given the benefit of including spouses in chronic disease management interventions (Martire, 2005), in which an important aspect of treatment success is behavior change in the spouse (Burmin and Margolin, 1992), identifying factors related to spouses' behavior is essential for the effective design of interventions. These interventions should better educate spouses to engage in behaviors that

facilitate, rather than detract from, their partners' diabetic diet and should include elements consistent with cultural and gender-specific relationship dynamics, as well as disease management beliefs and behaviors. The consideration of the broader sociocultural context is particularly important given the growing population of diverse older adults who are at a high risk for developing diabetes (CDC, 2017).

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