Family Support and Diet Barriers Among Older Hispanic Adults With Type 2 Diabetes

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Background and Objectives: *Diet plays an important role in the management of diabetes, and a suboptimal diet is a commonly identified problem. Family support may be important in overcoming barriers to good diet. We conducted this study to examine the role of the family in overcoming barriers to diet self-care among older Hispanic patients with diabetes.* Methods: *We performed a cross-sectional survey of 138 older Hispanic adults seeking care at an outpatient university clinic. Patients reported on their perception of family functioning, family support for diet, and barriers to diet self-care.* Results: *Level of family functioning was related to family support for diet self-care, and family support for diet was related to perceived barriers to diet self-care. Scores for family support were higher for those who perceived their family as functional compared to those who perceived their family as mildly dysfunctional or dysfunctional. As family support for diet increased, perceived barriers to diet self-care decreased.* Conclusions: *To fully understand difficulties encountered by older Hispanic adults with adherence to a diabetic diet, primary care physicians should explore the role of family support and family functioning. For those with poorly functioning families or low levels of family support, family-level interventions may need to be considered.*

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Type 2 diabetes disproportionately burdens the elderly and minority groups in the United States.[1,2] Mexican Americans, the largest Hispanic/Latino subgroup, are almost twice as likely to have diabetes as non-Hispanic whites of similar age.[3] Diet plays an important role in the management of blood glucose control in diabetes, and inadequate diet is a commonly identified problem of diabetes management.[4-9] Research has indicated that several barriers exist to adherence to a diabetic prudent diet.[8,10-12]

Barriers to self-care refer to the environmental and cognitive factors that interfere with following the recommended treatment regimen. For older adults, family support may be important in overcoming barriers to self-care. The characteristics of the patient's family environment in which diabetes management takes place have been associated with self-management behaviors.[13,14] Among Hispanics, the extended family is considered a primary support group.[15,16]

Although most would agree that family function and perceived and actual family support would influence a patient's adherence to diet, surprisingly little research has been conducted on this matter in adults with diabetes and even less among older Hispanics with diabetes. Instead, most of the research on the families' influences on diabetes management has focused on children, adolescents, and young adults.[17-19] The implications of these findings for older Hispanics are unknown.

Fisher et al found that family structure and organization were associated with good diet and exercise among non-elderly Hispanic patients with diabetes.[13] In another study of predominantly older African American adults with diabetes, researchers reported that family support was related to the pattern of diet self-care behaviors.[11] We hypothesized that perceived family function and family support are associated with barriers to diet self-care among older Hispanic adults with type 2 diabetes.

This study examined how family function, family support, selected demographic variables, and disease characteristics are related to the older Hispanic adult's perception of barriers to diet self-care. The specific objectives of the study included: (1) to determine the level of perceived barriers to diet among older Hispan-

ics who have diabetes, (2) to evaluate the level of perceived family support specific to diet and level of family function, and (3) to examine the relationship between perceived family support and demographic and disease characteristics with perceived barriers to diet.

Methods

Participants

Older patients at an ambulatory care center, within a tax-supported county health care system in the Southwest, were approached as they presented for care in the clinic reception area by the principal investigator or trained bilingual research assistant. The patients were asked to participate in a survey about their family and factors related to diabetes self-care. The inclusion criteria included: (1) adults ages 55 or older, (2) diagnosed with diabetes (type 2) for at least 1 year, (3) prescribed diabetes medication, (4) living in a family environment, and (5) able to provide informed consent.

Living in a family environment was defined as (1) living with a spouse/significant other, (2) living with spouse/significant other and children, (3) living with children, or (4) living with family or friends. Inclusion criteria included patients who were prescribed medications, because this study is part of a larger study that examined the relationship between the family environment and diabetes self-care in the four regimen areas—diet, exercise, medications, and self-monitoring of blood glucose.[12]

The exclusion criteria included (1) treatment for major psychiatric problems within the previous 6 months, because patients who received treatment for major psychiatric problems such as schizophrenia may not provide valid responses to questions about their diabetes self-care behaviors, (2) scoring of 15 or higher on the Patient Health Questionnaire depression screen,[20] because depression might affect their perception of barriers to self-care and perception of family functioning, or (3) insulin therapy initiated during the 6-month period preceding the study, since this would represent a major modification in medication management that would require adjustment from both patient and family member(s) and may not accurately reflect the perceived support or barriers to self-care. Other exclusions included (4) presence of major complications that may affect performance of diabetes self-management activities such as cognitive impairment, end-stage renal disease, and blindness or (5) a requirement for nursing care, such as home health nurse assisting with diabetes management.

Procedures

The interviewer briefly explained the purpose of the study to patients during their clinic visit and screened for eligibility for the study. Patients were asked if they were age 55 or older, if they have been diagnosed with diabetes for more than a year, and if they live with family. Those who met the inclusion criteria were given more information about the purpose of the study and were asked to participate. The survey was available in English and in Spanish and was completed either before or after the physician visit. Each participant was given a book on diabetes (either in English or in Spanish) as a token of appreciation for participating in the study. Family members who accompanied patients were asked to leave the area so the participant could complete the survey. Approval from our Institutional Review Board was obtained.

Measures

Barriers to Diet Self-care. Barriers to diet self-care were measured with the diet subscale of the Barriers to Self-care Scale developed by Glasgow and associates.[21] The seven-item scale measures the frequency of both environmental and cognitive factors that interfere with following a recommended diet. The scale has been validated on adults with type 2 diabetes. The internal consistency for the diet subscale ranges from 0.55 to 0.92 (Cronbach's alpha).[8,21]

The instrument asks respondents to rate how frequently they experience various barriers to diet self-care using a 7-point frequency of occurrence scale from 1 (very rarely or never) to 7 (daily). The scale was scored by averaging the responses across the items. Higher scores indicate a higher frequency of barriers.

Family Support. Perceived family support for diet was assessed with the diet subscale from the Diabetes Family Behavior Checklist II (DFBC-II).[4] There were two items that measure positive and two items that measure negative support specific to diet. For example, participants were asked to rate how often a particular family member will "praise you for following your diet" (positive support) and will "eat foods that are not part of your diabetic diet" (negative support). The response format is a 5-point scale from 1 (never) to 5 (at least once a day).

The diet component scores for the DFBC-II were calculated by adding the positive items and subtracting the ratings of the negative items.[4] A high component score indicates a strong perception of positive interactions with the rated family members. To complete the DFBC-II, respondents were asked to think about one family member with whom they generally have the most contact.

Family Function. Family function was measured using the Family APGAR Scale.[22] The Family APGAR is a validated scale of family function. The scale was developed as a tool to measure a family member's perception of five dimensions of family function: adaptability, partnership, growth, affection, and resolution.

Scores on the Family APGAR assess the overall satisfaction with family life and provide a composite measure of perceived family functioning. In diabetes, the Family APGAR has been used in several studies examining family function and the relationship to glycemic control[23,24] and the relationship between family function and quality of life in adults with type 2 diabetes.[25]

This instrument can be used with either a 3- or 5-point scale. For research purposes, the authors of the Family APGAR recommended that the 5-point scale be used because this improves the instrument's reliability.[26] Each question has five possible responses: "always" (4 points), "almost always" (3 points), "some of the time" (2 points), "hardly ever" (1 point), and "never" (0 points). The participants answer questions dealing with the level of satisfaction with each one of the five aspects of family life as they apply to each family member.

For example, participants rated how satisfied they were with "the help that I receive from family member when something is troubling me." The APGAR score for each family member was calculated by summing the scores of the five items in the scale. The overall APGAR score for each participant was calculated by summing the APGAR scores for the participant and dividing by the number of family members rated. The total score ranges from 0 to 20. The higher the score, the higher the level of perceived family function. The 5-point scale was interpreted as functional (15–20), mildly dysfunctional (9–14), and dysfunctional (0–8). The interpretation of the scores is based on previous work by other researchers with the Family APGAR.[24,27-29] The internal consistency for the tool with a five-choice response format has been reported to be 0.86 (Cronbach's alpha).[22] The instrument has been correlated with the Pless-Satterwhite measure of family function and with clinicians' rating of family.[30]

Demographic and Health Variables. In addition to the above scales, there were items on the survey regarding age, gender, education, income, acculturation (language based), duration of diabetes, and number of diabetes-related comorbidities. Education, income, and duration of diabetes were self-reported. The comorbidities were obtained from the clinical chart. The comorbidities related to diabetes included microvascular and macrovascular disorders. Microvascular disorders included retinopathy, nephropathy, neuropathy, and foot problems. Macrovascular disorders included cardiovascular disease, cerebral vascular disease, and peripheral vascular disease.

The scale developed by Deyo and associates is a simple scale for quantifying English use among Mexican Americans.[31] The scale consists of four brief questions regarding language. Language has been found to

be an important behavioral indicator of acculturation.[32] The language scale appears to be reliable and valid. Scale scores were found to have significant associations with major demographic characteristics that were considered to be correlated with acculturation.[31] Each patient in our study was given a total score by assigning 1 point for each response favoring English and zero points for each response favoring Spanish. The patient has a score ranging from zero to 4, with higher scores reflecting higher levels of acculturation.

Spanish Translation of Instrument

A Spanish version of the instrument was developed by translating the English version of the instrument into Spanish and then back translating it into English. Linguistics professionals experienced with health surveys translated and back translated the instrument. Any discrepancies were corrected using the consensus of three bilingual experts. The bilingual experts included two linguistic professionals and a bilingual staff member with the Institutional Review Board, whose responsibility is to review surveys.

Statistical Analysis

Descriptive statistics provided information on all variables. For the analyses, marital status categories were collapsed into two categories—married and not married. Married include living with a significant other. Not married included being divorced, separated, widowed, or never married. Household status was also collapsed into two categories for the analysis—lives with spouse/significant other only (couple only) or lives with family (included spouse/significant other and children; children and or other family members). In addition, educational level was collapsed into two response levels: (1) 8 or less years of schooling and (2) some high school or high school graduate/some college or college graduate.

Non-parametric test (Mann-Whitney U) was used with variables with non-normal distributions. Parametric tests were used when appropriate. Univariate analyses were used to examine the relationship between the initial set of predictors and barriers to diet. A regression model was used, and the variables included in the model were those that showed a significance level of 0.25 in the univariate analysis.[33,34] All other analyses were established a priori at $P<.05$ for acceptance. The Statistical Package for the Social Sciences (SPSS) for Windows® Version 11.5 was used for all statistical analyses.

Results

Of the 186 patients who were approached for participation, 170 agreed to participate, and of those, 138 were self-identified as Mexican Americans and met the inclusion criteria for the study. Demographic and fam-

ily characteristics of the participating subjects are presented in Table 1.

The mean scores for the diet barrier scale are shown in Table 2. The most frequent barrier reported was "being around people who are eating or drinking things that I shouldn't." Results of the family support scale (DFBC-II), on which respondents were asked to select one family member with whom they generally have the most contact, are shown in Table 1. Almost half of the sample (44.2%) reported that the family member selected ate foods that were not a part of their diet "at least once a day." The overall median score for diet family support was 1.00 (interquartile range=3.0), which indicates a moderate level of positive support. The range for the scale is -8 to 8, with higher numbers indicating more perceived positive support.

The maximum number of family members rated by a single participant with the Family APGAR scale was five. The median APGAR score for the sample was 18 (interquartile range=6), which indicates a high level of family function (range=0 to 20). The scores for the Family APGAR were skewed so that the scores were collapsed to categories for the analyses. A score of 15 or above was categorized as "functional." A score of 14 or less was categorized as "mildly dysfunctional" or "dysfunctional." Approximately 72% were categorized as "functional," and 28% were "moderately dysfunctional" or "dysfunctional."

Table 3 presents the average rank scores for diet family support and the mean diet barriers scores by family function (APGAR) and gender. The average rank for diet support score was significantly higher in the functional group. There were no significant differences in the diet barrier scores among the functional and dysfunctional groups or by gender. Additionally, there were no significant differences in family function scores among men and women (chi square=0.820, *P*=.365).

The initial set of independent variables selected for the univariate analyses included age, gender, education, income, duration of diabetes, number of diabetes-related comorbidities, marital status, household status, family APGAR, and diet family support. Table 4 presents the results of the analyses. Univariate analyses were used to condense the pool of initial variables entered into the final multiple regression model. Variables that were significant at the 0.25 level were selected for the final model, and these included age, gender, marital status, diabetes comorbidities, duration of diabetes, and diet family support. A multiple regression analysis was conducted to examine the relationship between these variables and barriers to diet (Table 5). The final model explained 14.4% of the variance for barriers to diet self-care. The linear combination of the predictor variables was significantly related to barriers to diet (F=3.62; *df*=6, 135; *P*=.002). In the final model, age and diet family support were the only two

Table 1

Demographic and Family Characteristics

Characteristic	n	Mean (SD)
Age (years)	138	64.1 (6.84)
Duration of diabetes (years)	138	13.4 (9.46)
Number of diabetes-related comorbidities	137[1]	1.9 (1.15)
Acculturation score (range from 0 to 4)[2]	138	1.8 (0.98)

Gender	n	Percentage
Females	92	66.7
Total	138	100.0

Marital status	n	Percentage
Married	75	54.3
Widowed	32	23.2
Divorced or separated	27	19.6
Never married	4	2.9
Total	138	100.0

Household status	n	Percentage
Lives with spouse or significant other	54	39.1
Lives with children	44	31.9
Lives with spouse or significant other and children	22	15.9
Lives with relatives and friends	18	13.0
Total	138	99.9[3]

Educational level	n	Percentage
Grade school or less (0–8)	66	48.2
Some high school (9–11)	26	19.0
High school graduate or GED	31	22.6
Some college or college degree	14	10.2
Total	137[4]	100.0

Total family monthly income	n	Percentage
Less than $500	21	16.9
$501 to $1,000	47	37.9
$1,001 to $1,500	43	34.7
$1,501 or greater	13	10.5
Total	124[5]	100.0

Employment status	n	Percentage
Employed	22	16.1
Not employed/retired	115	83.9
Total	137[5]	100.0

Family member with most contact	n	Percentage
Son or daughter	46	33.3
Husband	42	30.4
Wife	30	23.9
Other (siblings, nephews, aunts, housemate)	20	12.3
Total	138	99.9[3]

		Mean (SD)
Average time spent with family member (waking hours) in hours per day		7.6 (4.69)

[1] One chart not available
[2] Acculturation scale ranges from 0 to 4 (higher numbers indicate more acculturation.)
[3] Does not equal 100% due to rounding error.
[4] One respondent did not provide a response.
[5] Fourteen respondents did not provide responses.

SD—standard deviation
GED—general equivalency diploma

Table 2

Mean Scores for Barrier to Diet Self-care Scale

Item	n	Mean (SD)
How often do each of the following happen to you?		
Around people who are eating and drinking things I shouldn't	138	4.83 (2.42)
Not home for meals	138	3.85 (2.12)
Think about costs of foods	137	3.20 (2.12)
Unsure about foods	137	3.12 (2.17)
Still feel hungry	137	2.93 (2.06)
Don't have time to prepare foods	136	2.43 (2.04)
Won't matter if don't follow diet	138	2.23 (1.91)
Overall scale score	137	3.22 (1.07)

Scale: 1=very rarely or never, 2=once per month, 3=twice per month, 4= once per week, 5=twice per week, 6=more than twice weekly, and 7=daily

significant predictors of barriers to diet. Table 6 presents the bivariate correlations among the variables in the model.

Discussion

Older Hispanic adults with higher levels of family support for diet self-care reported fewer barriers to diet self-care. Moreover, those who reported higher levels of family support for diet were also more likely to report living in a functional family setting.

Why should level of family support be inversely related to perceived barriers for diet self-care? Barriers to care that have been associated with the management of diabetes are based primarily within the family setting.[35] The most frequent diet barrier reported in this study was "being around people who are eating or drinking things that I shouldn't." This may be a problem for Hispanic older adults because the Hispanic family household size is larger than those of non-Hispanic whites.[36] In 2000, almost one third of family households in which a Hispanic person was a member consisted of five or more people.[37] Only 11.8% of non-Hispanic white family households were this large. More than 40% of our subjects reported that the family member they spend the most time with eats foods that are not part of their diet "at least once a day." Participants in other studies have reported that it can be difficult to adhere to a diet regimen if the rest of the family was not willing to eat the same foods that the participants were eating, and preparing two different types of meals may be difficult for most families.[11,38]

The level of perceived family support specific to diabetes was moderate. There were not any gender differences on perceived family support for diet. Brown et al reported that males expressed stronger perceptions of social support for diet than did women.[39] This may be due to the gender role differences in this culture where women are responsible for cooking and preparing meals. The sample in the Brown study was younger (mean age=54 years) than the present study. There may

Table 3

Mean Diet Barriers and Diet DFBC Scores by Family Function and Gender

Family function	Diet Barriers*						Diet DFBC**			
	n	Mean	SD	t	df	P Value	n	Mean Rank	z	P Value
Functional (≥ 15)	99	3.17	1.07	-0.95	134	.346	99	74.64	-2.728	.006
Mildly dysfunctional/ dysfunctional (≤ 14)	37	3.36	1.08	—	—	—	38	54.30	—	—
Gender										
Males	46	3.02	0.94	-1.54	135	0.126	46	67.47	-0.429	.668
Females	91	3.31	1.12	—	—	—	92	70.52	—	—

Scale: Diet barriers: 1 (never or rarely) to 7 (daily); Diet DFBC: range from -8 to 8 with higher scores indicating more perceived support

* Parametric test used—diet barriers variable displays characteristics of normal distribution as tested by Shapiro-Wilk's statistic = 0.982; P>.05

** Non-parametric test (Mann-Whitney U) used for non-normally distributed variable

DFBC—Diabetes Family Behavior Checklist

Table 4

Univariate Analyses Between the Initial Set of Independent Variables and the Dependent Variable—Perceived Barriers to Diet Self-Care

Variable	F	n	P Value
Age	10.38	136	.002
Gender	2.37	136	.126
Diabetes-related comorbidities	1.80	135	.182
Duration of diabetes	2.11	136	.149
Marital status	2.02	136	.157
Household status	0.02	136	.900
Diet DFBC	4.92	136	.028
Family APGAR	0.89	135	.346
Education	1.18	135	.280
Income—monthly	0.02	121	.886

DFBC—Diabetes Family Behavior Checklist

Table 5

Multiple Linear Regression Analysis of Barriers to Diet Self-care

Variables	Beta	SE	t	Significance
Age	-0.04	0.02	-2.41	0.02
Gender	0.37	0.20	1.88	0.06
Diet DFBC	-0.09	0.04	-2.51	0.01
Diabetes comorbidities	-0.04	0.08	-0.48	0.63
Duration of diabetes	-0.01	0.01	-0.71	0.48
Marital status	-0.26	0.20	-1.44	0.15

SE—standard error
DFBC—Diabetes Family Behavior Checklist

not have been any gender differences in our study because our sample was older, and participants may have depended on the support from their children or other family members.

The structural function theory may be used to explain the second question of why family functioning is related to the level of family support for diabetes. The theory provides a framework for assessing families and health. The structural functional framework defines the family as a social system.[40] Illness of a family member results in changes of the family structure and function. The theory focuses on the family structure and function and how well the family structure performs its function. The concept of structure refers to how the family is organized, the manner in which the units are arranged, and how these units relate to each other.[40] The concept of function refers to what the family does and why it exists. Structure is assessed by the Family APGAR, and function is assessed by the family support specific to diabetes. Family function serves as a resource for social support for the patient.[41]

To examine the factors associated with perceived barriers to diet self-care, a regression analysis resulted in a model that explained a modest 14% of the variance in perceived barriers. Family support specific to diet and age were significant predictors of barriers to diet. The greater the family support for diet, the less the perceived barriers. Age had an inverse relationship with perceived barriers. This finding is consistent with other studies exam-

ining the relationship between age and perceived barriers.[8,42]

Limitations

The results of this study should be interpreted cautiously since there are several important limitations. One limitation is that the study was cross-sectional, and causality cannot be determined. Perhaps those who perceive their families as being more supportive also perceive fewer barriers to self-care, because they generally have a positive outlook. Longitudinal studies are needed to assess the relationship between family support and barriers to self-care over time. Further, the family interactions were self-reported. Also, the sample was limited to those adults living in a family environment and with lower income. Finally, the results of the study are not generalizable to all older Hispanic adults.

The findings from this study have important implications for primary care physicians, dieticians, and diabetes educators. Previous research has shown that barriers to self-care play an important role in adherence to

Table 6

Bivariate Correlations of Variables in Final Regression Model

Variables	Diet Barrier	Age	Gender	Diet DFBC	Comorbid	Duration	Marital Status
Diet Barrier	1						
Age	-0.27**	1					
Gender	0.13	-0.06	1				
Diet DFBC	-0.20*	0.02	0.07	1			
Comorbid	-0.11	0.13*	0.07	.010	1		
Duration	-0.11	0.39**	0.04	-0.13	0.12	1	
Marital status	-0.11	0.42*	0.22**	-0.01	-0.009	0.04	1

DFBC—Diabetes Family Behavior Checklist

*   Correlation is significant at the 0.05 level.
**   Correlation is significant at the 0.01 level.

diet recommendations.[4,6-9] Diet self-care behaviors are deeply rooted in culture and lifestyle. Educational programs that take into consideration the culture and lifestyle of patients and family are needed. For example, for patients with poorly controlled diabetes and poor adherence to diet, consideration should be given to including the family in office visits and other interventions. Further research should be conducted to see if including family in office visits does, in fact, improve adherence.

Family functioning is associated with diet family support, thus health care providers might consider assessing family functioning when low levels of family support for diet are present and refer for family counseling if indicated. Improving family support is important not only because it is associated with lower levels of perceived barriers to diet self-care, but family support specific to diabetes has also been shown to be related to diabetes self-management activities.[12,18] The greater the perceived support, the greater the self-reported adherence with the diabetes regimen.

Conclusions

The findings from this study indicate that family functioning is related to family support for diet self-care and that such support is inversely related to perceived barriers to following the diet regimen. Knowledge of family function and perceived support may be useful to health care providers in the care of older Hispanic adults with diabetes.

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With type 2 diabetes increasing, the effect of this traditional diet pattern on glycemic response has not been studied fully. We evaluated the glycemic response of bean and rice traditional meals compared to rice alone in adults with type 2 diabetes. Seventeen men and women with type 2 diabetes controlled by metformin (n = 14) or diet/exercise (n = 3) aged 35–70 years participated in the randomized 4 × 4 crossover trial. The white long grain rice control, pinto beans/rice, black beans/rice, red kidney beans/rice test meals, matched for 50 grams of available carbohydrate, were consumed at break... Wen LK, Parchman ML, Shepherd MD: Family support and diet barriers among older Hispanic adults with type 2 diabetes. Fam Med. 2004, 36: 423-430. Perceived family support for diet was assessed with Diabetes Family Behavior Checklist II diet subscale. Barriers to diet were measured with diet subscale of Barriers to Self-care Scale. Participants screened for nutritional risk according to MNA (Mini Nutritional Assessment) tool. Following a recommended diabetes diet regimen may be particularly challenging for elderly Libyan patients with type 2 diabetes because of the traditional Libyan diet that of high carbohydrate and fatty foods. Therefore, the present study sought to determine the level of perceived family support for diet and barriers to diet self care and their relation to malnutrition among elderly Libyan with type 2 diabetes taking patient's gender into consideration. Methods. Study design, sample and setting. RESEARCH DESIGN AND METHODS Adults with type 2 diabetes participated in focus group sessions that discussed barriers and facilitators to diabetes management (n = 45) and/or completed surveys (n = 61) to… CONTINUE READING. View on ADA. Family support and diet barriers among older Hispanic adults with type 2 diabetes. L. Wen, M. Parchman, M. Shepherd. Medicine.