

Health-Promoting Lifestyle and Diabetes Knowledge in Hispanic American Adults

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Abstract:

This study examined the relationships among demographics, a health-promoting lifestyle, and diabetes knowledge. A descriptive study was conducted in a convenience sample of 40 Hispanic American adults. Participants were recruited from Hispanic churches in the southeastern United States. The Health Promoting Lifestyle Profile II and the Diabetes Knowledge Questionnaire were used to assess participants' health-promoting lifestyle and diabetes knowledge. Participants had low levels of a health-promoting lifestyle and a strong deficiency in diabetes knowledge. Income was found to be associated with physical activity lifestyle. Age and education were significantly related to diabetes knowledge. This study suggested that community health nurses should assess and educate Hispanic American adults for a health-promoting lifestyle and diabetes knowledge and use appropriate methods of teaching with low-literacy and audiovisual materials to provide culturally specific care to this vulnerable group. **Key Words:** Hispanic American adults; health-promoting lifestyle; diabetes knowledge

Article:

The prevalence of type 2 diabetes continues to rise in the United States. In 2002, the American Diabetes Association reported that approximately 18.2 million people were affected by diabetes (6.3% of the population); 13 million people were diagnosed with the disease and 5.2 million were assumed to be undiagnosed. The Hispanic population in the United States is disproportionately affected by the condition: 10.2% of Hispanics have diabetes compared to 8.4% of non-Hispanic Whites (American Diabetes Association, 2005b). Diabetes prevalence among Hispanics varies with the country of origin. Approximately 24% of Mexican Americans, 26% of Puerto Ricans, and 16% of Cubans in the United States between the ages of 45 and 74 have diabetes (American Diabetes Association, 2005a). Of the estimated 2 million Hispanics with diabetes, only about half actually know their diagnosis. Diabetic nephropathy and kidney and liver failure are 3 to 7 times higher in Mexican Americans than Whites. The rate of amputations is 2 to 4 times higher in minorities than among non-Hispanic Whites (Tripp-Reimer, Choi, Kelley, & Enslein, 2001). Earlier detection, intervention, and culturally competent education to improve self-management in Hispanic Americans may result in better outcomes.

Although previous studies (Greenhalgh, Helman, & Chowdhury, 1998; Zgibor & Simmons, 2002) have examined the effects of health beliefs among other minorities, few studies have assessed health-promoting lifestyle and knowledge about type 2 diabetes in Hispanics. Identifying a health-promoting lifestyle and knowledge deficits about risk factors for disease can assist nurses in planning interventions to meet the health needs of the increasing Hispanic population.

This study, therefore, examined Hispanic adults' health-promoting lifestyle and knowledge of diabetes. The study addressed the following research questions:

- What are Hispanic American adults' health-promoting lifestyles (health responsibility, physical activity, and nutrition)?
- What are Hispanic American adults' knowledge levels regarding diabetes?
- What is the relationship between demographic characteristics and a health promotion lifestyle profile (health responsibility, physical activity, and nutrition) in Hispanic American adults?
- What is the relationship between demographic characteristics (age, education, income, and gender) and knowledge about diabetes for Hispanic American adults?

CONCEPTUAL FRAMEWORK

The health promotion model (Pender, Murdaugh, & Parsons, 2001) was used to examine a health-promoting lifestyle and knowledge of diabetes among Hispanic adults. The model has three major components: cognitive-perceptual factors that directly influence participation in health-promoting behaviors, modifying factors that indirectly affect health-promoting behaviors through their direct action on the cognitive-perceptual factors, and probability of participating in health-promoting behavior (Duffy, 1997). This study focused on the cognitive-perceptual factor of perceived control of health (health-promoting lifestyle), knowledge (knowledge regarding diabetes), and perceived health status (self-rated general health) and on the modifying factors of demographic characteristics (age, gender, income, education) and situational (language, acculturation) in the Hispanic population.

BACKGROUND

The prevalence of diabetes increases with certain situational factors, such as poverty and education (Robbins, Vaccarino, Zhang, & Kasl, 2001). Previous research has found that diabetes was associated with less education, low income, and higher Body Mass Index (BMI) among the Mexican American population with diabetes (West et al., 2002). Risk of diabetes was also associated with greater acculturation among Hispanic Americans with type 2 diabetes (West et al., 2002). Hispanic Americans reported fair and poor self-rated health (Lorraine, Hammock, & Blanton, 2005; Zunker, Rutt, & Meza, 2005). Damian, Ruigomez, Passtor, and Martin-Moreno (1999) examined the main determinants of self-assessed health among older Spanish adults and reported that the number of chronic conditions was one of the clearest determinants of self-rated health. Older age, less education, lack of health care coverage, being Hispanic, having a lower income, obesity, and lack of exercise were found to contribute to fair and poor self-rated health (Lorraine et al., 2005).

A health-promoting lifestyle is the key factor in self-management of diabetes. A health-promoting lifestyle has been defined as patterns of activities that enhance the health of the individual (Walker, Sechrist, & Pender, 1987). Engaging in health promotion behaviors was associated with high internal locus of control, perceived self-efficacy, the belief in one's personal competence to carry out a specific action (Duffy, 1997), and quality of life (Stuifbergen, Seraphine, & Roberts, 2000). Heisler, Smith, Hayward, Krein, and Kerr (2003) found that higher patient self-rating of diabetes self-management was significantly associated with better glycemic control. Women were more likely than men to participate in health-promoting behaviors such as diet and exercise (Nothwehr & Stump, 2000) and had higher nutritional and health-responsibility activities (Johnson, 2005). Wen, Shepherd & Parchman (2004) reported that age was a significant predictor of levels of diet self-care. Older adults showed a higher level of diet self-care compared to younger adults.

Knowledge about diabetes, medication, diet, physical activity, and glucose monitoring are important factors in self-management and diabetes outcomes. Hispanic Americans with type 2 diabetes have shown major deficits in diabetes knowledge (von Goeler, Rosal, Ockene, Scavron, & De Torrijos, 2003). Lack of knowledge about diabetes has been identified as one of the barriers to self-management of diabetes (Brice, 2000; Firestone et al., 2004; von Goeler et al., 2003). Firestone et al. (2004) have reported that increased diabetes knowledge is associated with more education, years with diabetes diagnosis, and use of a glucometer to monitor blood glucose. Lack of understanding of how to manage diabetes also has a significant impact on limited diabetes knowledge in this population (Arcury, Skelly, Gesler, & Dougherty, 2004; Daniulaityte, 2004; von Goeler et al., 2003).

Age and gender have been considered important factors in assessing diabetes knowledge (Daniulaityte, 2004). Arcury and colleagues (2004) reported age and gender differences in diabetes-related knowledge and beliefs. They found that younger women had less knowledge about the cause and consequences of diabetes than older women and men. The comparison of men and women in age groups on beliefs about diabetes revealed that older women and men understood that diabetes could be controlled but not cured, whereas younger women and men believed that diabetes could be cured. Other authors argue that cultural beliefs regarding diabetes and its management might also be associated with the knowledge of diabetes (Weller, Baer, Pachter, & Trotter, 1999).

A multitude of factors may be related to health-promoting lifestyles and diabetes knowledge in Hispanic Americans. However, few studies have examined these factors related to diabetes in Hispanic Americans. This study is an attempt to fill some of those gaps in our knowledge of health-promoting lifestyles and diabetic knowledge among Hispanic American adults.

METHOD

Research Design

A descriptive design was used to examine a health-promoting lifestyle and knowledge of diabetes in Hispanic adults.

Sample and Setting

A volunteer sample was recruited from two local Hispanic churches in the southeastern United States. Churches were selected as access portals due to the important social role they play in the Hispanic community. The area includes both rural and small urban areas with limited mass transportation. It is important to note that a large increase in the Hispanic population (greater than 400%) has occurred in the past 10 years. Inclusion criteria included (a) an age of 18 years or older, (b) ability to speak Spanish or English, and (c) self-identification as of Hispanic descent.

Participants were recruited through announcements, posted flyers, and personal contact in two local churches with majority Hispanic attendance or membership. After agreeing to participate, persons were asked a convenient time and place to meet the data collector. Most often, the church was the meeting place. After obtaining consent, a demographic questionnaire and health-promoting lifestyle and diabetes knowledge were collected by the investigator or a trained volunteer who spoke both English and Spanish. Interviews averaged 20-30 min in length and were conducted in Spanish or English according to the participant's preference. When the questionnaires were completed, the data collector gave each participant a packet of information about diabetes in the preferred language (English or Spanish). Prior to recruitment, the study was approved by the university institutional review board.

Instruments

A demographic form was used to document modifying factors (age, gender, socioeconomic status). Language acculturation was assessed for situational factors using the Language Acculturation Questionnaire that asked participants what language or languages they used to speak, read, think, speak at home, and speak with friends and children. Scores ranged from 1 (only Spanish) to 5 (only English). Higher scores indicated greater language acculturation.

The Health Promoting Lifestyle Profile (HPLP) II was used to examine perceived control of health (Walker et al., 1987). The HPLP II is a 52-item Likert-type scale questionnaire with 1 (never) to 4 (routinely) measuring the frequency of self-reported health-promoting behaviors in the domains of Health Responsibility, Physical Activity, Nutrition, Spiritual Growth, Interpersonal Relations, and Stress Management. Subscale scores were calculated, with higher scores reflecting a higher level of specific and general health-promoting lifestyle. The questionnaire has been used in both Spanish and English in studies. Reliability of the instruments has been reported with Cronbach's alphas (English version) of Health Responsibility, .86; Physical Activity, .85; Nutrition, .80; Spiritual Growth, .86; Interpersonal Relations, .87; Stress Management, .79; and total HPLP II,

.94 (Stuifbergen & Roberts, 1997). In this study, the subscales of Health Responsibility, Physical Activity, and Nutrition were examined. Cronbach's alphas ranged from .72 to .80 for Health Responsibility, Physical Activity, and Nutrition, respectively, in this sample.

The Diabetes Knowledge Questionnaire (DKQ-24), which was developed from the original DQK-60 (Garcia, Villagomez, Brown, Kouzekanani, & Hanis, 2001), was used to examine cognitive-perceptual factors (knowledge about diabetes). The DKQ-24 consists of 24 questions that assess overall diabetes knowledge as recommended by the National Standards for Diabetes Patient Education programs. Both English and Spanish versions were available. The DKQ was answered as 1 = "yes," 2 = "no," or 3 = "I don't know" to questions about diabetes. Knowledge items were scored as correct (1) or incorrect (0). Only 17 items were used, to avoid duplication and multicollinearity with HPLP II. A total score of the correct items was summed, with higher scores indicating more knowledge (range 0-17). Validity and reliability have been established through studies on multiple populations, settings, and psychometric testing (Garcia et al., 2001; Firestone et al., 2004). A Cronbach's alpha of .87 was achieved in this sample.

Data Analysis

Descriptive statistics were used to characterize the sample on demographics, acculturation, and health status. Those statistics were also used to answer Research Questions 1 and 2. Pearson's correlation coefficient was used to examine the relationships between demographic variables, health-promoting lifestyle, and diabetes knowledge in Questions 3 and 4. Cronbach's alpha was the internal reliability coefficient measured. An alpha level of .05 was used. SPSS-PC 13.0 software was used for data management and analysis.

RESULTS

A total of 40 individuals participated in the study. The mean age was 32.4 years (SD = 14.96) with a range from 16-81. The proportion of men and women was similar, and the majority of participants were married (see Table 1). Almost all (92.5%) were Mexican American; 5% were Central Americans, and 2.5% classified themselves as "other." The average number of persons living in a household was 4 (SD = 1.29). Most persons had less than high school education.

Eighty-seven percent of the participants rated their health as good to fair. Ten percent reported actually being diagnosed with diabetes, with a mean age of 35 (SD = 13.89) at diagnosis. Of these diabetics, 66.7% reported being on a combination therapy of pills and glucose injections, and 33% reported using pills only. Half of those diagnosed with diabetes reported gaining information about diabetes and self-care from a special diabetes education program, and half reported receiving no education. Forty-one percent of the participants diagnosed with diabetes had a relative with diabetes. Of those reporting a relative with diabetes, 28.6% of their relatives were fathers, 21.4% were mothers, and 21.4% reported more than one person in the family (mother, father, sister, brother, aunt or uncle, grandparents) with diabetes. A small percentage (7.5%) of the participants reported that they were diagnosed with hypertension, but 27.5% did not know if they had high

TABLE 1
Demographic Variables of the Participants (N = 40)

<i>Variable</i>	<i>%</i>	<i>n</i>
Sex		
Male	45	18
Female	55	22
Marital status		
Married	80	32
Widowed	2.5	1
Divorced	10	4
Never married	7.5	3
Education		
Less than high school	76	30
High school	24	9
Annual income		
Less than \$10,000	30	12
\$10,000 or more	35	14
Missing data	35	14

blood pressure. A very small percentage (2.5%) were diagnosed with elevated cholesterol, but 50% did not know if their cholesterol was normal.

In terms of language acculturation, Spanish was the only language spoken at home for 70% of the sample, whereas 22.5% spoke mostly Spanish and some English at home. Fifty-five percent of the participants usually read and spoke in Spanish, whereas 25% read and spoke Spanish better than English. Sixty-five percent reported that they thought in Spanish. During leisure times with friends, 65% of the respondents reported that they spoke only Spanish, 17.5% spoke Spanish better than English, and 15.0% reported they spoke both languages equally. Ninety percent of the sample reported that as a child they had spoken only Spanish. The mean score of acculturation was 1.50 (SD = 0.75), indicating low language acculturation.

Research Question 1 was concerned with health- promoting lifestyles of the adults. Participants reported low scores on health-promoting lifestyles in the domain of responsibility, physical activity, and nutrition. Nutrition lifestyle was the most positive. Table 2 provides mean scores of the HPLP subscales of interest.

Research Question 2 explores cognitive perceptual factors: adult Hispanic Americans' knowledge levels regarding type 2 diabetes. Overall, the participants had a low level of diabetes knowledge. Specific types of knowledge are presented in Table 3, including either

TABLE 2
Mean Scores of the Health Promotion and Lifestyle Profile and Diabetes Knowledge (N = 40)

<i>Variable</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Range</i>
Health responsibility	1.56	0.44	1.00-2.56
Physical activity	1.56	0.43	1.00-2.88
Nutrition	1.95	0.45	1.00-2.89
Diabetes knowledge	6.27	3.03	1.00-14.00

the correct answer or a lack of knowledge. The majority did not know whether eating too much sugar and other sweets was a cause of diabetes, whether the cause of diabetes was a lack of effective insulin in the body, and whether diabetes was caused by a failure of the kidneys to keep sugar out of the urine. Many participants did not know that blood sugar would increase in untreated diabetes; however, more than half knew that if they had diabetes, they might pass the disease on to their children. Over half of the participants knew that diabetes cannot be cured. The majority did not know whether regular exercise would raise blood glucose (62.5% answered they did not know and 22.5% answered incorrectly) and did not know whether diabetes would cause bad circulation. Almost half of the participants did not know whether frequent urination and thirst are signs of low blood sugar.

Research Question 3 explored the relationships among age, income, education, and a health-promoting lifestyle in Hispanic American adults. A significant relationship was demonstrated between higher income and better physical activity, but no significant relationships were found between age, education, and health responsibility or nutrition and physical activity (see Table 4).

Research Question 4 examined the relationship between demographic characteristics and knowledge about diabetes of Hispanic American adults. Significant relationships were found between having a high school education and greater knowledge of diabetes and older age and greater knowledge of diabetes. There were no significant relationships between income and greater knowledge about diabetes or gender and knowledge (see Table 4).

DISCUSSION

The purpose of this study was to examine Hispanic American adults' health-promoting lifestyle and diabetes knowledge using the health promotion model (Pender et al., 2001) as a conceptual framework. Findings in this study support the health promotion model that perceived control of health (health responsibility) and knowledge (diabetes knowledge) are associated with demographic characteristics.

Results of the study indicate that Hispanic adults engage in few health-promoting lifestyle behaviors. Although physical activity and nutrition are important in diabetes management, the sample in this study showed a low level of health responsibility, physical activity, and nutrition. Comparing the HPLP II subscale mean scores of participants in this study with African American population in other studies (Brady & Nies, 1999; Johnson, 2005), Hispanic adults in this study scored lower than African American adults. Similarly, less dietary adherence and misconception about traditional foods have been reported in low-income Puerto Ricans with type 2 diabetes (von Goeler et al., 2003). The characteristics of the sample—a lower level of socioeconomic status and education and less acculturation—may explain the fact that Hispanic American adults in this study engaged in less health-promoting lifestyles and had poor diabetes knowledge.

The relationship between income and physical activity found in this study suggests that higher socioeconomic status may contribute to health-promoting activities of Hispanic adults. Brady and Nies (1999) also found that African American women who lived above poverty level engaged in more health-promoting behaviors than those who lived below poverty level. The majority of the participants reported that they never or rarely participated in health promotion activities. This finding suggests that community health nurses need to provide education on the benefits of physical activity to health for low-income Hispanic American adults. Age and education were not found to be significantly associated with a health-promoting lifestyle, which contradicted previous reports (Nothwehr & Stump, 2000, Wen, Shepherd, & Parchman, 2004). Wen and colleagues (2004) found that older adults had a higher level of diet self-care. However, gender was not related to a health-promoting lifestyle in this study, consistent with Wen and colleagues' study that gender was not a significant predictor of diet or exercise.

The majority of the participants were deficient in knowledge of diabetes. Of the 17 questions asked about diabetes, only 5 were answered correctly by most of the participants. The other questions had either incorrect answers or the participants did not know

TABLE 3
Diabetes Knowledge of Hispanic American Adults (N = 40)

<i>Question</i>	<i>Correct (%)</i>	<i>Did Not Know (%)</i>
Consumption of excess sugar causes diabetes.	40.0	40.0
Diabetes is caused by a lack of insulin in the body.	32.5	62.5
Failure of the kidneys to keep sugar out of the urine causes diabetes.	12.5	77.5
Kidneys produce insulin.	15.0	82.5
Uncontrolled diabetes causes an increase in sugar in the blood.	47.5	47.5
Being diabetic puts my children at an increased risk of developing the disease.	60.0	35.0
There is a cure for diabetes.	57.5	30.0
Regular exercise raises blood sugar levels.	15.0	62.5
Diabetes causes poor circulation.	42.5	55.0
With diabetes, cuts and sores heal more slowly.	7.1	92.9
Diabetics should take extra care when cutting toenails.	75.0	25.0
Diabetes damages the kidneys.	42.5	52.5
Feeling can be lost in hands, fingers, and feet with diabetes.	22.5	65.0
High blood sugar levels causes feelings of shaking and sweating.	5.0	65.0
Feelings of increased thirst and frequent urination may signify low blood sugar.	7.5	47.5
A diabetic diet is made up of special foods.	2.5	42.5
Diabetics should have an eye exam once every year.	57.5	42.5

TABLE 4
Pearson's Correlation Between Selected Demographic Variables, Health-Promoting Lifestyle Factors, and Diabetes Knowledge (N = 40)

<i>Variable</i>	<i>Health Responsibility (r)</i>	<i>Physical Activity (r)</i>	<i>Nutrition (r)</i>	<i>Diabetes Knowledge (r)</i>
Age	.10	-.19	.01	.36*
Gender	.22	-.20	.17	.23
Education	.07	.12	.12	.33*
Income	-.12	.30*	.28	.02

**p* < .05.

the answers. This sample, with less acculturation and English-speaking pattern, may indicate that situational factors such as acculturation or language barrier play important roles in diabetes management. This validates previous research findings that Mexican Americans shared a single cultural belief on diabetes, which might also be an important factor in diabetes-related knowledge (Daniulaityte, 2004).

Age and education were associated with diabetes knowledge. The older and better educated people are, the better their understanding and thus the greater their ability to carry out health promotion activities. The association between level of education and knowledge of diabetes is consistent with previous studies (Arcury et al., 2004; Daniulaityte, 2004; Firestone et al., 2004). Contradictory to the findings of Firestone and colleagues (2004) that those of a younger age had great knowledge of diabetes, our study demonstrated that older age was associated with knowledge of diabetes, which may reflect a sample difference. In addition, the majority of the respondents in this study were monolingual, Spanish-speaking adults.

Language barriers

may prevent the Hispanic client from seeking out educational venues, visiting doctors, practicing self-monitoring of blood glucose, and having a higher sense of self-efficacy in diabetes management (Bernal, Woolley, Schensul, & Dickinson, 2000; Fiscella, Franks, Doescher, & Saver, 2002; Karter, Ferrara, Darbinian, Ackerson, & Selby, 2000). Acculturation and being able to communicate with one's health care providers to better understand health-promoting activities are important for control of health in this population.

Clinical Implications

The findings of this research convey the importance of providing culturally competent care to Hispanic patients for better control of disease processes and reductions in health disparities. This study also revealed that Hispanic Americans are deficient in diabetes knowledge. Lack of knowledge about diabetes may prevent Hispanic American adults from early detection and prevention of the disease. Without adequate knowledge of the disease, it would be difficult for them to control the disease and change behavior. If these deficient areas are focused on in easily understandable educational programs, inaccuracies could be clarified, promoting health and preventing disease. After teaching, it is important for community health nurses to assess what the client has understood. Generally, Hispanic clients are low income and with little education. Lower level of education may have limited their diabetes knowledge and understanding of the content of educational materials. This may require different methods of teaching and evaluation than those used with mainstream English-speaking diabetics, such as using TV, radio, or news stories, as recommended by the National Diabetes Education Program (2005).

The majority of these participants had only an eighth-grade education. Some respondents in this study had completed some high school, but several had never attended school. New teaching methods that rely less on written materials need to be developed for this population. One recommendation is that educational materials be provided to this population with bilingual materials in low-literacy level and in audiovisual format. Without understanding a diagnosis or the risk factors that predispose one to disease, health-promoting behaviors may occur at best haphazardly.

Cultural-specific and sensitive intervention programs that incorporate cultural beliefs and traditional diet should be developed, with emphasis on increasing diabetes knowledge and promoting a healthy lifestyle. Community health nurses should educate Hispanics about the importance of health responsibility, physical activity, and nutrition that incorporate cultural beliefs. In addition, community health nurses should identify cultural difference and language barriers that might prevent Hispanic American adults from understanding diabetes-related knowledge and engaging in a health-promoting lifestyle. In addition, they should be made aware of community resources that are available for low-income, bilingual, and monolingual Hispanic American clients.

Limitations

Limitations to this study include a small sample and that participants recruited from the two Hispanic churches may not reflect the majority of Hispanic American population. Additional factors, such as cultural, attitudes toward illness and acceptance of medical advice, and prioritization of health in life concerns (von Goeler et al., 2003) might contribute to a health-promoting lifestyle and diabetes knowledge but were not examined in the study.

Future research could be conducted with a larger sample to examine the relationship between knowledge and behavior changes in Hispanic American adults with diabetes. More investigation of the perceived control of health, health promotion activities, and living with diabetes among this vulnerable population will be imperative as we attempt to reduce health disparities, control health costs, and improve quality and longevity of life.

CONCLUSIONS

Our study demonstrated that Hispanic American adults in this study engaged in lower levels of health-promoting lifestyle behaviors and had a knowledge deficiency regarding diabetes. Health disparities continue in this population. Additional strategies and efforts are necessary to combat the complications, mortality, and morbidity associated with high rates of diabetes. More frequent screening, and teaching and evaluation of

promotion and prevention efforts, are needed with consideration of the low literacy and cultural context for this population.

REFERENCES

American Diabetes Association. (2005a). *Diabetes among Latinos*. Retrieved August 18, 2005, from <http://www.diabetes.org/diabetesstatistics/latinos.jsp>

sp

American Diabetes Association. (2005b). *National diabetes fact sheet*. Retrieved August 18, 2005, from <http://www.diabetes.org/diabetesstatistics/national-diabetes-fact-sheet.jsp>

Arcury, T. A., Skelly, A. H., Gesler, W. M., & Dougherty, M. (2004). Diabetes meanings among those without diabetes: Explanatory models of immigrant Latinos in rural North Carolina. *Social Science & Medicine*, 59(11), 2183-2193.

Bernal, H., Woolley, S., Schensul, J. J., & Dickinson, J. K. (2000). Correlates of self-efficacy in diabetes self-care among Hispanic adults with diabetes. *The Diabetes Educator*, 26(4), 673-680.

Brady, B., & Nies, M. A. (1999). Health-promoting lifestyles and exercise: A comparison of older African American women above and below poverty level. *Journal of Holistic Nursing*, 17(2), 197-207.

Brice, A. (2000). Access to health service delivery for Hispanics: A communication issue. *Journal of Multicultural Nursing and Health*, 6, 7-17.

Damian, J., Ruigomez, A., Pastor, V., & Martin-Moreno, J. M. (1999). Determinants of self assessed health among Spanish older people living at home. *Journal of Epidemiology and Community Health*, 53(7), 412-416.

Daniulaityte, R. (2004). Making sense of diabetes: Cultural models, gender and individual adjustment to type 2 diabetes in a Mexican community. *Social Science & Medicine*, 59, 1899-1912.

Duffy, M. E. (1997). Determinants of reported health promotion behaviors in employed Mexican American women. *Health Care for Women International*, 18(2), 149-163.

Firestone, D., Jimenez-Bricerno, L., Reimann, J. O., Talavera, G. A., Polonsky, W. H., & Edelman, S. V. (2004). Predictors of diabetes-specific knowledge and treatment satisfaction among Costa Ricans. *The Diabetes Educator*, 30(2), 281-292.

Fiscella, K., Franks, P., Doescher, M. P., & Saver, B. G. (2002). Disparities in health care by race, ethnicity, and language among the insured: Findings from a national sample. *Medical Care*, 40(1), 52-59.

Garcia, A. A., Villagomez, E. T., Brown, S. A., Kouzekanani, K., & Hanis, C. L. (2001). The Starr County diabetes education study: Development of the Spanish language Diabetes Knowledge Questionnaire. *Diabetes Care*, 24(1), 16-21,

Greenhalgh, T., Helman, C., & Chowdhury, A. M. (1998). Health beliefs and folk models of diabetes in British Bangladeshis: A qualitative study. *British Medical Journal*, 316(7136), 978-983.

Heisler, M., Smith, D. M., Hayward, R. A., Krein, S. L., & Kerr, E. (2003). How well do patients' assessments of their diabetes self-management correlate with actual glycemic control and receipt of recommended diabetes services? *Diabetes Care*, 26(3), 738-743.

Johnson, R. L. (2005). Gender differences in health-promoting lifestyles of African Americans. *Public Health Nursing*, 22(2), 130-137.

Karter, A. J., Ferrara, A., Darbinian, J. A., Ackerson, L. M., & Selby, J. V. (2000). Self-monitoring of blood glucose: Language and financial barriers in a managed care population with diabetes. *Diabetes Care*, 23(4), 477-483.

- Lorraine, P. J., Hammock, R. L., & Blanton, J. M. (2005). Predictors of self-rated health status among Texas residents. *Current Diabetes Reports*, 5(3), 217-225.
- National Diabetes Education Program. (2005). *National Diabetes Education Program strategic plan October 2005-September 2007*. Retrieved November 29, 2005, from http://ndep.nih.gov/diabetes/pubs/NDEP_StrategicPlan_2005-2007.pdf
- Nothwehr, F., & Stump, T. (2000). Health-promoting behaviors among adults with type 2 diabetes: Findings from the health and retirement study. *Preventive Medicine*, 30, 407-414.
- Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2001). *Health Promotion in Nursing Practice* (4th ed.). Englewood Cliffs, NJ: Prentice Hall.
- Robbins, J. M., Vaccarino, V., Zhang, H., & Kasl, S. V. (2001). Socioeconomic status and type 2 diabetes of African American and non-Hispanic White women and men: Evidence from the Third National Health and Nutrition Examination Survey. *American Journal of Public Health*, 91(1), 76-83.
- Stuifbergen, A. K., & Roberts, G. J. (1997). Health promotion practices of women with multiple sclerosis. *Archives of Physical Medicine and Rehabilitation*, 78, 3-9.
- Stuifbergen, A. K., Seraphine, A., & Roberts, G. (2000). An explanatory model of health promotion and quality of life in chronic disabling conditions. *Nursing Research*, 49, 122-129.
- Tripp-Reimer, T., Choi, E., Kelley, L. S., & Enslein, J. C. (2001). Cultural barriers to care: Inverting the problem. *Diabetes Spectrum*, 14(1), 13-22.
- von Goeler, D. S., Rosal, M. C., Ockene, J. K., Scavron, J., & De Torrijos, F. D. (2003). Self-management of type 2 diabetes: A survey of low-income urban Puerto Ricans. *The Diabetes Educator*, 29(4), 663-672.
- Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The Health-Promoting Lifestyle Profile: Development and psychometric characteristics. *Nursing Research*, 36(2), 76-81.
- Weller, S. C., Baer, R. D., Pachter, L. M., & Trotter, R. T. (1999). Latino beliefs about diabetes. *Diabetes Care*, 22(5), 722-730.
- Wen, L. K., Shepherd, M. D., & Parchman, M. L. (2004). Family support, diet, and exercise among older Mexican Americans with type 2 diabetes. *The Diabetes Educator*, 30(6), 980-993.
- West, S. K., Munoz, B. K., Klein, R., Broman, A. T., Sanchez, R. S., Rodriguez, J., et al. (2002). Risk factors for type II diabetes and diabetic retinopathy in Mexican-American population: Proyecto ver. *American Journal of Ophthalmology*, 134(3), 390-398.
- Zgibor, J. C., & Simmons, D. (2002). Barriers to blood glucose monitoring in a multiethnic community. *Diabetes Care*, 25(10), 1772-1777.
- Zunker, C., Rutt, C., & Meza, G. (2005). Perceived health needs of elderly Mexicans living on the U.S.-Mexico border. *Journal of Transcultural Nursing*, 16(1), 50-56.