Home Remedies for Type 2 Diabetes Used by Mexican Americans in El Paso, Texas

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The purpose of this article is to examine the use of herbal remedies to treat Type 2 diabetes among Mexican Americans in El Paso County, Texas, on the U.S.-Mexico border. Interviews were conducted in Spanish with 22 Mexican American adults diagnosed with Type 2 diabetes mellitus. Open-ended questions were used to elicit the participants' beliefs about the appropriate treatment of Type 2 diabetes, including both Western biomedical and herbal therapy. Kleinman's explanatory model of illness served as the framework, and the grounded theory method was used for data analysis. A majority of participants were taking prescribed Western medications in conjunction with traditional Mexican folk remedies. Participants relied on the advice of family, friends, and neighbors to provide them with guidance, and some herbs used by participants were not indicated for the treatment of diabetes. Health care providers should be aware that Mexican American clients may make choices about herbal remedies without expert guidance and advice.

Keywords: *explanatory models; Type 2 diabetes; Mexican Americans; health
beliefs; herbal remedies*

The extent to which herbal and home remedies are used in the treatment of diabetes by Mexican Americans living along the

U.S.-Mexico border is not well documented. The purpose of this article is to examine the use of herbal and home remedies to treat Type 2 diabetes among a group of Mexican Americans living in four *colonias* in El Paso County, Texas. Colonias are unincorporated settlements located in the border region that generally lack water, sewage, and other basic services and infrastructure. More than 200 colonias have been identified in El Paso County. This discussion of herbal remedies, including folk and other alternative medications, represents a portion of the findings of a larger study examining explanatory models (EMs) of Type 2 diabetes among residents of this Texas-Mexico border region that is described elsewhere (Jezewski & Poss, 2002; Poss & Jezewski, 2002).

HISPANICS AND EXPLANATORY MODELS OF TYPE 2 DIABETES

TYPE 2 DIABETES MELLITUS

The prevalence of Type 2 diabetes mellitus, a metabolic disorder characterized by abnormal glucose metabolism, is higher among Hispanics than among Anglo populations. Among Mexican Americans older than age 19 in the United States, approximately 1 out of every 10 persons has diabetes (Harris et al., 1998). The San Antonio Heart Study revealed an increased incidence of Type 2 diabetes in Hispanics relative to non-Hispanic Whites (Haffner, Hazuda, Mitchell, Patterson, & Stern, 1991). In a study conducted by the El Paso Diabetes Association, prevalence of Type 2 diabetes was 16.5% among Mexican American adults in El Paso County; the authors estimated that an equal number of El Paso residents have undiagnosed diabetes (El Paso Diabetes Association, 2000).

About 90% of individuals who develop Type 2 diabetes are obese, and many have family members similarly affected. The pathophysiology of Type 2 diabetes includes insulin resistance at the peripheral tissues, inadequate insulin production to meet metabolic needs, and elevated production of glucose by

the liver, resulting in high serum glucose levels (Skyler & Hirsch, 2001). Type 2 diabetes is associated with significant morbidity and mortality, and its complications can be grouped into two categories: macrovascular disease (cardiovascular, peripheral vascular, and stroke) and microvascular disease (nephropathy, retinopathy, and neuropathy).

EM

In the present study, the authors used Kleinman's (1980) EM as a framework for eliciting Mexican Americans' beliefs about the treatment of their diabetes. EMs are ideas and beliefs about an illness that help persons to understand and make sense of an illness within a cultural context. Kleinman's EM provides a useful framework for analyzing an individual's understanding and explanation of illness and includes constructs such as illness etiology, symptoms, severity, social significance, and treatment, including the use of home remedies. The works of Kleinman (1980, 1986, 1988) and Kleinman, Eisenberg, and Good (1978) offer an approach and methodology for examining persons' perspectives on their illness experiences.

Several studies, for example, have examined the perceptions of Hispanic participants regarding the etiology of Type 2 diabetes. A study of Hispanics in the United States, Mexico, and Guatemala revealed that Mexican participants believed that *susto* (fright), anger, and strong emotions were causes of diabetes (Weller et al., 1999). In a study of explanatory models of diabetes in El Paso County, Texas, Poss and Jezewski (2002) found that most participants believed that an episode of severe fright or a terrifying emotional experience, which they termed *susto*, had precipitated their diabetes. *Susto* was conceptualized as an event or episode that caused the body to become more susceptible to the development of diabetes and not as an illness per se.

Researchers have studied the EMs of various illnesses, including hypertension (Blumhagen, 1982), autism (Gray, 1995), obesity (Allan, 1998) and tuberculosis (Poss, 1998). Although diabetes disproportionately affects persons of Hispanic background, there are few studies examining Hispanics' knowledge, beliefs, and practices regarding the use of home remedies in the treatment of Type 2 diabetes.

COMPLEMENTARY AND ALTERNATIVE MEDICINE

It is estimated that some form of complementary and alternative medicine (CAM) is used by about 42% of the population in the United States (Eisenberg et al., 1998). CAM is defined by the National Center for Complementary and Alternative Medicine (2002) as "a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine." In a recent nationally representative sample of the U.S. population, people with diabetes were found to be 1.6 times more likely to use CAM than were people without diabetes (Egede, Ye, Zheng, & Silverstein, 2002). A literature search revealed no studies examining the use of CAM among a national sample of Hispanics.

Eid and Kraemer (1998) found that Hispanic patients were likely to combine conventional medical treatment plans with their own folk remedies, including herbal teas and nopal (prickly pear cactus—*Opuntia spp.*). A study of Mexican Americans residing in a Texas-Mexico border community revealed that one third of those studied used home remedies in conjunction with their prescribed diabetes therapy (Brown & Hanis, 1999).

In a study of the use of alternative therapies among Mexican Americans living in south Texas, Keegan (1996) found that 44% of her participants had consulted with an alternative practitioner and had used herbal medicines at least once during the previous year. About 66% of the participants in this study reported that they did not inform their established primary health care provider about visits to alternative practitioners.

A study of Hispanic patients living in West Texas revealed that 53% of participants used folk remedies and healing rituals in addition to conventional medicine (Marsh & Hentges, 1988). Rivera, Ortiz, Lawson, and Verma (2002) studied 547 participants living in El Paso, Texas, and found that 64% of the Hispanic participants used herbal or home remedies. Of those using herbal remedies, 69% did not inform their health care provider. About 94% of the participants in this study reported that they learned about herbal therapies from friends and family members.

More than 400 traditional plant treatments for diabetes have been recorded, and many are commonly used as therapy in the

developing regions of the world (Bailey & Day, 1989). One species, *Opuntia streptacantha Lemaire*, has been shown to produce a hypoglycemic effect in patients with Type 2 diabetes, although the mechanism for this effect is not known (Frati-Munari, Gordillo, Altamirano, & Ariza, 1988). Nopal has been used for various indications since the time of the Aztecs (Torres, 1983), but its use as a treatment for diabetes is a recent addition to Mexican traditional medicine (Lozoya, 1999).

PURPOSE

The findings reported in this article are part of a larger qualitative study examining EMs of Type 2 diabetes among Mexican Americans living on the U.S.-Mexico border. We present the results of participants' EMs regarding the treatment of Type 2 diabetes. Kleinman's EM was employed as the guiding framework, and grounded theory was used as the methodology for collecting and analyzing the data. The purpose of this study was not to discover theory or to elucidate a basic social process but rather to use grounded theory methodology in the "emergent fit mode" (Glaser & Strauss, 1976), that is, to discover how the participants' beliefs fit with the constructs from Kleinman's EM.

SAMPLE

After obtaining the approval of the Institutional Review Board at the University of Texas at El Paso, the principal investigator (PI) (first author), who is bilingual (English/Spanish), conducted in-depth interviews in Spanish with 22 Mexican American adults diagnosed with Type 2 diabetes mellitus using an open-ended question format. Interviews were conducted between November 1999 and August 2000. Potential participants for the study were first approached by community health workers employed by health education centers in each of four colonias located on the outskirts of El Paso. The PI then met with the identified individuals to determine if they were interested in participating and if they met the study inclusion criteria: (a) diagnosis with Type 2 diabetes for more than 1 year, (b) Mexican American, (c) age 21 or older, and (d) residing in one of

the four colonias. After the interview was completed, each participant was paid $25 as compensation for his or her participation.

The demographic data for the participants are presented in Table 1. Study participants included 18 females and 4 males. The majority of participants ($n = 18$) were born in Mexico, whereas 4 were born in the United States to Mexican-born parents. Eighteen participants had attended diabetes classes, although three had attended only one or two classes. Three participants were bilingual (English/Spanish), whereas the remainder spoke only Spanish.

METHODS

INSTRUMENTATION AND TRANSLATION PROCESS

Kleinman's (1980) EM of illness was applied as the framework to elicit in-depth descriptions of Mexican Americans' explanations of how to treat Type 2 diabetes. The interview schedule consisted of open-ended questions designed to follow the concepts in Kleinman's model and formulated to elicit the participants' beliefs and feelings about appropriate treatment of Type 2 diabetes using both Western biomedical and herbal therapy.

Kleinman's questions for eliciting EMs were applied as a starting point and were modified during data collection and analysis based on the tenets of the constant comparative method of grounded theory analysis. As analysis progressed and EM categories emerged, additional interview questions were added to elicit information to saturate categories. The following questions related to treatment decisions are examples of the initial questions asked of the participants. The PI then probed with additional questions to obtain more in-depth information and clarify participants' beliefs about using herbal and home remedies for Type 2 diabetes.

- If you have diabetes, who should treat it?
- How should diabetes be treated in most cases?
- Tell me what you know about oral medications used to treat diabetes.
- Tell me what you know about using insulin to treat diabetes.
- What do you take to treat your diabetes?

Table 1
Demographic Variables (N = 22)

Variable	Range	Mean
Age	29-77	53
Years living with diabetes	1-45	14
Years of schooling	0-14	6
Monthly income, in dollars (*n* = 15)[a]	390-4,000	865

a. Seven participants were unable or unwilling to furnish data on income.

- Other than medicines you get at the pharmacy, what treatments can be used to treat Type 2 diabetes?

Translation/back-translation methods were employed in the development of the bilingual statement of informed consent and the interview instrument. Both documents were written in English at a fifth-grade reading level and were translated into equivalent Spanish by a qualified translator familiar with the Spanish used in the El Paso area. The Spanish version was translated back into English by a second qualified translator, and the results were compared with the original English version. To ensure clarity of both the English and Spanish versions, modifications were made to the instruments with the assistance of the translators, following recommendations for decentering in the development of dual language instruments (Brislin, Lonner, & Thorndike, 1973; Lange, 2002; Marín & Marín, 1991). Because many participants had minimal formal education or were functionally illiterate, the statement of informed consent was read aloud to them.

PROCEDURES

Each of the 22 audiotaped interviews was conducted in Spanish and lasted between 1.5 and 2 hours. The tapes were transcribed verbatim in Spanish and then translated into English by a bilingual research assistant. All transcriptions and translations were reviewed by the PI to ensure accuracy and clarity.

The PI also conducted three focus groups (FGs), each ranging in size from 4 to 6 persons, all of whom had participated in the original interviews. The purpose of the FGs was to present the researchers' construction of the EM to the participants,

hear their comments and feedback, and clarify concepts and beliefs that were not well developed after the initial data analysis. Each FG session lasted 1.5 to 2.5 hours and was audiotaped, transcribed, and translated in the same manner as the interviews.

DATA ANALYSIS

Kleinman's (1980) concept of EM served as the guiding framework for data analysis. Glaser and Strauss's (1967) grounded theory method of data analysis, which uses open coding to develop categories based in the data, was applied to the interview data (Glaser, 1978; Strauss & Corbin, 1990). Each investigator coded the interview data individually and wrote extensive memos regarding the coding and analysis. Investigators read each other's memos and then met to discuss the coded data until they arrived at consensus on the categories and their properties.

After formulating an initial EM based on the individual interviews, the PI presented this model to the FG participants to validate the preliminary findings and analysis. The investigators then individually analyzed the data from the FGs and finally met to discuss, revise, and expand the preliminary EM. The final EM was formulated after extensive discussion and analysis.

FINDINGS

Many participants in this study were taking both prescribed Western medications for diabetes, either an oral medication or injected insulin, in conjunction with traditional Mexican folk remedies. Table 2 provides a summary of all of the herbal remedies mentioned by participants during the interviews and focus groups. Several of the remedies, including Diabetil Tea and Diabe Cure, are composed of multiple herbs, and these components are indicated in Table 2. During analysis of the interviews, no one herb emerged as being better than others in treating diabetes; a number of participants had tried a variety of different herbs.

Table 2

Home Remedies Used by Participants

Spanish Common Name	English Common Name	Botanical Name	Uses Reported	Comments
Te Diabetil[a]	Diabetil Tea		Diabetes	Sold as prepared tea—Add boiling water to make tea
Malabar		Malabar officinalis		
Prodigiosa	Bricklebush	Brickellia cavanillesi; veronicaefolia		
Catarinilla		Salpianthus macrodonthus		
Lagrimas S.P.	Job's tears	Coix lachryma—jobi		
Changarro	Trumpet tree	Cecropia obtusifolia; mexicana		
Guayacán (Palo Santo)	Tree of life	Guaiacum spp. (G. Coulteri; sanctum)		
Tronadora	Yellow bells	Tecoma spp. (T. Molis; stans)		
Diabe Cure[a]			Diabetes	Sold as prepared tea—Add boiling water to make tea
Atanasia amarga	Bricklebush	Brickellia cavanillesi		
Vainas de judias	Bean pods	Phaseolus vulgaris		
Cascara sagrada	Buckthorn	Rhamnus purshiana		
Guarumbo	Trumpet tree	Cecropia obtusifolia		
Guayacán	Tree of life	Guaiacum sanctum		
Matarique		Cacalia descomposita		
Eucalipto	Eucalyptus	Eucalyptus globulus		
Tronadora	Yellow bells	Tecoma spp. (T. Molis; stans)		
Catarinita		Salpianthus microdonthus		
Prodigiosa	Bricklebush	Brickellia cavanillesi		
Te Malabar	Malabar tea	Malabar officinalis	Diabetes	Sold as prepared tea—Add boiling water to make tea

Te Huereque	Huereque tea	Ibervillea sonorae	Diabetes	Sold as prepared tea—Add boiling water to make tea
Te Wereke	Wereke tea			
Gobernadora	Creosote	Larrea spp. (L. Tridentata; divaricata)	1. Diabetes[b]	1 and 2. Boil leaves and stems briefly in water to make tea
Guamis			2. Arthritis	
Hediondilla			3. Treat diabetic wounds[b]	3. Apply leaves directly to wound and cover with gauze
			4. Treat fungal dermatitis	4. Boil in leaves in water and apply liquid to skin
			5. Treat edema of extremities[b]	5. Boil in leaves in water and apply liquid to skin
Nopal	Prickly pear cactus	Opuntia spp. (O. Ficus indica; O. streptacantha)	Diabetes	1. Peel leaves, boil then sauté with celery, tomatoes, onions, red peppers, parsley, cilantro, or other herbs
				2. Cut in pieces, mix in electric blender with celery, lemon, fruit juices, sábila (aloe), or parsley.
Sábila, Zábila	Aloe vera	Aloe vera L. Liliaceae	Diabetes	Put in blender (with other ingredients or alone) and drink juice
Maguey	Century plant	Agave spp.	Diabetes	Put in blender (with other ingredients or alone) and drink juice
Lechuguilla	Lechugilla	Agave lechuguilla		
Parras silvestres	Wild grapes	Vitis spp. (V. bourgaeana)	Diabetes[b]	Boil leaves and vines in water to make tea
Lágrimas de San Pedro	Job's tears	Coix lachryma—jobi	Diabetes	Boil leaves in water to make tea

(continued)

Table 2 (continued)

Spanish Common Name	English Common Name	Botanical Name	Uses Reported	Comments
Barbas de elote Pelo de elote	Cornsilk	Zea mays	Diabetes[b]	Boil silk in water to make tea[c]
Copalquin, Torote	Elephant tree	Bursera microphylla	1. Diabetes[b] 2. Stomach problems	Boil leaves in water to make tea
Uña de gato	Cat's claw mimosa	Mimosa biuncifera	1. Diabetes 2. Cancer 3. Prostate cancer	Boil leaves in water to make tea
Gatuño	Cat's claw Acacia	Acacia greggii	1. Diabetes 2. Cancer 3. Prostate cancer	Boil leaves in water to make tea[d]
Mora Mora negra	Mulberry leaves	Morus nigra	Diabetes[b]	Boil leaves from both the male and female plant in water to make tea
Orina	Urine	N/A	1. Diabetes[b] 2. Cancer	Drink first voided urine alone or with fruit juice
Víbora de cascabel	Rattlesnake meat	Crotalus spp.	1. Diabetes[b] 2. Hypertension 3. Cancer 4. Fortify immune system	Cook meat and eat or grind cooked meat and use on other foods

SOURCE: Duke (1998), Duke and Vasquez (1994), Moore (1990), Schoenhals (1988), and Torres (1983).
a. Ingredients that follow are components of this remedy.
b. Not a recognized use for this herb, according to third author.
c. Generally used as a diuretic and mild urinary antiseptic.
d. Bark also can be used as a decoction.

At the time of the interviews, 6 participants were using insulin as part of their regimen, and 4 others, who currently had Type 2 diabetes, had previously taken insulin during pregnancy to treat gestational diabetes mellitus. Those participants who were not taking insulin were uniformly concerned about having to use it in the future to treat their diabetes. For some individuals, the fear of insulin injections provided motivation to follow their prescribed diet and exercise regimen and to take good care of themselves.

Participants also feared having to initiate insulin therapy because this indicated to them that their diabetes had become more serious or more advanced. Some participants believed that insulin caused blindness, and several related stories of relatives who had become blind shortly after starting insulin therapy. Participants also believed that continued use of insulin would eventually lead to "dependence" on this medication. They described it as something akin to a drug abuser being "hooked" on illegal injectable drugs.

The majority of participants ($n = 17$) were taking oral medications to control their diabetes, one in conjunction with insulin. Most had a basic understanding of how these medicines worked in the body, although they considered the oral medication to be "something like insulin." Some participants understood, for example, that the medications helped the pancreas to produce more insulin, and a few understood that the medications helped to reduce insulin resistance. Participants reported that the overall effect of oral medication was to reduce blood glucose levels.

A number of participants believed that both herbal and conventional Western medications were effective, and they saw no reason not to combine them. Several participants realized, however, that the additive effect of the herbal and conventional medications might lower their blood sugar excessively, and so they decreased the dosage of or eliminated completely the herbal remedy if their health care provider increased the dose of a Western medication. As one participant stated, "When I started taking Glucotrol, I stopped drinking the herbal tea. I used to drink it, but I don't anymore because I am afraid that my blood sugar may go down too much."

Even respondents who were not using herbal remedies knew of someone (relative, friend, or neighbor) who used home

remedies to treat their diabetes. Although a few participants believed that herbs existed that could actually cure their illness, most felt that herbal treatments could control diabetes. When asked if diabetes could be cured, one woman responded,

> I do not think so, although a lot of people I know think that diabetes can be cured. But that is not true. Once my mother gave me some money, and I went to a program where a man told me that if I followed his instructions, I would get rid of the diabetes. But it was not true. I spent a lot of money, and I got even worse.

Several participants related that they preferred herbal remedies because they were "natural." They always tried to obtain "fresh" herbs for their treatment, and several stated that they would rather take fresh herbs than the pills containing dried herbs available in health food stores. Many participants who used herbal remedies went across the U.S.-Mexico border, generally to Ciudad Juarez, to purchase these remedies.

Most participants did not tell their physicians about the use of herbal remedies because they were afraid of being "scolded." Several noted that most doctors trained in the United States do not believe in herbs. Even the participants who were using only Western medicines wished that U.S. physicians knew more about herbal medicines. Several expressed that it would be ideal to have a health care provider who understood and was willing to use both systems to treat diabetes and other illnesses.

Participants realized that a great deal of knowledge about herbal remedies had been lost in the generations of Mexicans who moved to the United States from Mexico. One participant recalled that her grandmother, mother, and other relatives in Mexico were familiar with the use of home remedies, whereas she knew virtually nothing about them. Overall, study participants had only a superficial understanding of how to prepare and use specific herbs. A few participants who were unfamiliar with the use of herbal remedies indicated that they were reluctant to use them. The majority, however, relied on the advice of family, friends, and neighbors to guide them on using home remedies to treat their diabetes. Those giving the advice often knew little about the use of herbs, and in two cases, participants became ill after taking an herbal remedy recommended by a friend or acquaintance. Several participants stated that

people with diabetes were willing to try anything to get better because "we want so badly to get rid of this disease."

Participants in the study did not necessarily know how to prepare an herbal remedy or how it worked. Those who had more knowledge about herbs could explain how to prepare them, mostly as teas, but they could not explain exactly how they worked in the body, except to say they lowered blood sugar. Several herbs used by study participants for diabetes were not indicated for the treatment of diabetes (see notes for Table 2).

The home remedy used most frequently to treat diabetes by participants was nopal (the leaf of the prickly pear cactus—*Opuntia spp.*). All but one participant thought that nopal helped to control diabetes, but participants' ideas about nopal varied. For example, some participants thought nopal was simply a nutritious and healthy food that was beneficial to eat. Nopal was a staple food for those who could obtain "good" nopal, which was described as new leaves with a light green color. According to participants, nopal from Mexico was better than the nopal that could be purchased in El Paso, probably because it was fresher. The slimy consistency of nopal was the only major drawback listed, and it was the primary reason some participants did not want to eat it.

Participants described different ways to prepare nopal as food. Primarily they peeled the nopal, boiled it, and then sautéed it in either oil or lard along with celery, tomatoes, onions, parsley, cilantro, or other herbs. Others used nopal in salads or to prepare soups. Most participants thought of nopal as a food when prepared this way, but they felt it had some medicinal value as well.

Other participants prepared nopal to be taken as a medicine. They prepared it as a shake by washing it, cutting it in pieces, and mixing the pieces in an electric blender with other ingredients, such as celery, fruit juices, *sábila* (aloe), and herbs like parsley. Participants drank this shake one or two times a day, generally first thing in the morning before eating.

Participants considered that raw nopal prepared as a shake had more medicinal properties and was better at lowering blood sugar than when it was cooked with other vegetables and eaten as a food. Some people in the study also cut up the nopal and put it in water in the refrigerator and drank the "nopal

water." Several participants knew of others who were able to control their diabetes successfully by taking only nopal. One participant believed that taking nopal regularly could also prevent the development of diabetes. A few participants reported that placing a piece of nopal on a wound would speed its healing, and nopal was also reported to alleviate constipation and to "fortify the blood."

DISCUSSION

Mexican Americans come from a country with a deeply ingrained history of using herbal remedies, and they are likely to use herbs to treat a variety of conditions. In this article, we reported the results of a study of beliefs about and use of herbal and home remedies to treat Type 2 diabetes among Mexican Americans living on the U.S.-Mexico border in El Paso County, Texas. This analysis of beliefs about treatment is part of a larger study of EMs of Type 2 diabetes and represents one component of the total EM.

Because of the nature of this study and the methodology employed, it is not possible to know if the study results will apply to other Mexican Americans living on the border with Mexico. The results, however, may have implications for understanding the treatment decisions and use of herbal remedies by Mexican Americans in the border region. When individuals cross borders, their EMs of illness and its treatment begins to undergo modifications as they incorporate aspects of the new medical belief system (Jezewski & Poss, 2002; Poss & Jezewski, 2002). With the passage of time, EMs evolve and change, and they can be understood only after careful questioning and analysis.

Although most study participants were taking oral hypoglycemic agents or insulin to treat their diabetes, they also used a variety of herbal remedies. Nearly all participants knew of others in the community who were using herbs to treat diabetes. The home remedy used most often by participants, nopal, was used both in food preparation and as a blended drink intended to lower blood sugar. Participants had many misconceptions about insulin, including that it caused blindness or addiction, and they feared having to use it.

Consistent with other studies, participants in this study believed their health care providers would admonish them for taking herbs to treat diabetes, and they did not inform their providers about the alternative treatments they were using. It is likely that a majority of patients in the border region do not tell their health care providers that they are using herbal remedies along with, or instead of, prescribed medicines (Rivera et al., 2002).

Many participants in this study chose herbal remedies on the basis of recommendations from friends and family members. In a number of cases, the herbs they chose were not indicated for the treatment of Type 2 diabetes. Participants were not knowledgeable about the preparation of herbal remedies, and they did not understand the mechanism of action of the remedies used. Participants often relied on their own judgment about titrating doses, including decreasing or discontinuing herbal remedies when allopathic medications were changed.

APPLICATION

The results of this study have implications for the care of patients with diabetes, both Mexican Americans and others. According to the results of national studies (Egede et al., 2002; Eisenberg et al., 1998), a significant number of persons in the United States use CAM. Providers and educators should be aware that many patients, including Mexican Americans living along the U.S.-Mexico border, use home and herbal remedies to treat Type 2 diabetes and other chronic illnesses. Nurses must be able to elicit information about the use of these remedies from their patients in a sensitive, culturally competent, and nonjudgmental manner.

Nurses should be aware that clients may make choices about herbal remedies based on recommendations from friends and family and without the benefit of expert guidance and advice. This can create potentially dangerous situations when herbs are used for the wrong indications or when herbs are combined with incompatible allopathic medications. It is essential to have an up-to-date and inclusive list of all herbal and home remedies on each client's medical record. Nurses should also make use of textbooks, journal articles, and databases to help them determine if there are potentially dangerous

interactions between herbal remedies and allopathic medicines.

Nurses should incorporate into their practice a discussion of alternative treatments as well as other components of the client's EMs. Failure to do so may result in clients not returning for additional care or failing to follow prescribed regimens because they feel their beliefs are not recognized or valued by the provider. Clients may not trust providers who are not aware of home and herbal remedies. In addition, providers must recognize that home and herbal remedies may be significantly less expensive and more easily available to clients than allopathic medications.

Clients use their EMs to make decisions how and when to use herbal remedies in conjunction with prescribed medicines. Kleinman et al. (1978), in their classic article, warned that, unless providers understand both their own and their clients' EMs of illness, effective plans of care cannot be designed. All decisions have to be negotiated by understanding the client's perspective and integrating it with the biomedical explanation of the client's illness to ensure that the plan of care will be followed.

As Mexicans migrate to the United States and become distanced from their cultural roots, fewer herbalists and *curanderos* will be available to guide the use of herbs, and the knowledge of herbal remedies will likely erode further. Persons with diabetes living on the U.S.-Mexico border will continue to use herbal remedies, but they will have less access to knowledgeable sources of information about the indications for and the proper use of herbal remedies. By being aware that Mexican clients may be using home remedies, nurses can assess their use of alternative remedies and make use of available resources about herbal products to assist clients in making safe and informed decisions.

REFERENCES

Allan, J. D. (1998). Explanatory models of overweight among African American, Euro-American, and Mexican American women. *Western Journal of Nursing Research*, *20*, 45-66.

Bailey, C. J., & Day, C. (1989). Traditional plant medicines as treatments for diabetes. *Diabetes Care*, *12*, 553-564.

Blumhagen, D. (1982). The meaning of hypertension. In N. Chrisman & T. Maretzke (Eds.), *Clinically applied anthropology.* Boston: D. Reidel.

Brislin, R. W., Lonner, W. J., & Thorndike, E. M. (1973). *Cross-cultural research methods.* New York: John Wiley.

Brown, S. A., & Hanis, C. L. (1999). Culturally competent diabetes education for Mexican Americans: The Starr County study. *The Diabetes Educator, 25,* 226-236.

Duke, J. A. (1998). *La farmacia natural.* Emmaus, PA: Rodale Press.

Duke, J. A., & Vasquez, R. (1994). *Amazonia ethnobotanical dictionary.* Boca Raton, FL: CRC Press.

Egede, L. E., Ye, X., Zheng, D, & Silverstein, M. D. (2002). The prevalence and pattern of complementary and alternative medicine use in individuals with diabetes.*Diabetes Care, 25,* 324-329.

Eid, J., & Kraemer, H. (1998). Mexican American experience with diabetes. *Image: Journal of Nursing Scholarship, 30,* 393.

Eisenberg, D. M., Davis, R. B., Ettner, S. L., Appel, S., Wilkey, S., Van Rompay, M. et al. (1998). Trends in alternative medicine use in the United States, 1990-1997. *Journal of the American Medical Association, 280,* 1569-1575.

El Paso Diabetes Association. (2000). *Diabetes awareness and education in the community survey: Summary Report.* El Paso, TX: Author.

Frati-Munari, A. C., Gordillo, B. E., Altamirano, P., & Ariza, C. R. (1988). Hypoglycemic effect of Opuntia streptacantha Lemaire in NIDDM. *Diabetes Care, 11,* 63-66.

Glaser, B. (1978). *Theoretical sensitivity.* Mill Valley, CA: Sociology Press.

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research.* Chicago: Aldine Press.

Gray, D. (1995). Lay conceptions of autism: Parents' explanatory models. *Medical Anthropology, 16,* 99-118.

Haffner, S. M., Hazuda, H. P., Mitchell, B. D., Patterson, J. K., & Stern, M. P. (1991). Increased incidence of Type II diabetes mellitus in Mexican Americans. *Diabetes Care, 14,* 102-108.

Harris, M. I., Flegal, K. M., Cowie, C. C., Eberhardt, M. S., Goldstein, D. E., Little, R. R., et al. (1998). Prevalence of diabetes, impaired fasting glucose, and impaired glucose tolerance in U.S. adults: The Third National Health and Nutrition Examination Survey (NHANES), 1988-94. *Diabetes Care, 21,* 518-524.

Jezewski, M. A., & Poss, J. (2002). Mexican Americans' explanatory model of Type 2 diabetes. *Western Journal of Nursing Research, 24,* 840-858.

Keegan, L. (1996). Use of alternative therapies among Mexican Americans in the Texas Rio Grande Valley. *Journal of Holistic Nursing, 14,* 277-294.

Kleinman, A. (1980). *Patients and healers in the context of culture: An exploration of the borderland between anthropology, medicine, and psychiatry.* Berkeley: University of California Press.

Kleinman, A. (1986). *Social origins of disease and distress: Neurasthenia, pain and depression in modern China.* New Haven, CT: Yale University Press.

Kleinman, A. (1988). *The illness narratives.* Boston: Beacon.

Kleinman, A., Eisenberg, L., & Good, B. (1978). Culture, illness and care: Clinical lessons from anthropologic and cross-cultural research. *Annals of Internal Medicine, 88,* 251-258.

Lange, J. W. (2002). Methodological concerns for non-Hispanic investigators conducting research with Hispanic Americans. *Research in Nursing & Health, 25,* 411-419.

Lozoya, X. (1999). *Xiuhpatli: Herba officinalis.* Mexico City, Mexico: Universidad Nacional Autónoma de México.

Marín, G., & Marín, B. V. (1991). *Research with Hispanic populations.* Newbury Park, CA: Sage.

Marsh, W. W., & Hentges, K. (1988). Mexican folk remedies and conventional medical care. *American Family Physician, 37,* 257-262.

Moore, M. (1990). *Los Remedios: Traditional herbal remedies of the southwest.* Santa Fe, NM: Red Crane Books.

National Center for Complementary and Alternative Medicine. (2002). *What is complementary and alternative medicine?* Retrieved April 14, 2003, from http://nccam.nih.gov/health/whatiscam/#sup2

Poss, J. (1998). The meanings of tuberculosis for Mexican migrant farmworkers in the United States. *Social Science & Medicine, 47,* 195-202.

Poss, J., & Jezewski, M. A. (2002). The role and meaning of susto in Mexican Americans' explanatory model of Type 2 diabetes. *Medical Anthropology Quarterly, 16,* 360-377.

Rivera, J. O., Ortiz, M., Lawson, M. E., & Verma, K. M. (2002). Evaluation of the use of complementary and alternative medicine in the largest United States-Mexico border city. *Pharmacotherapy, 22,* 256-264.

Schoenhals, L. C. (1988). *A Spanish-English glossary of Mexican flora and fauna.* Mexico City, Mexico: Summer Institute of Linguistics.

Skyler, J. S., & Hirsch, I. B. (2001). Diabetes mellitus. In J. Noble (Ed.), *Textbook of primary care medicine* (pp. 821-842). St. Louis, MO: Mosby.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research.* Newbury Park, CA: Sage.

Torres, E. (1983). *Green medicine: Traditional Mexican-American herbal remedies.* Kingsville, TX: Nieves Press.

Weller, S. C., Baer, R. D., Pachter, L. M., Trotter, R. T., Glazer, M., de Alba Garcia, J. E., et al. (1999). Latino beliefs about diabetes. *Diabetes Care, 22,* 722-728.

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