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Knowledge of Type II Diabetes and its Complications Among Adult Vietnamese Immigrants

Thao Phuong Le
San Jose State University

KNOWLEDGE OF TYPE II DIABETES AND ITS COMPLICATIONS AMONG ADULT VIETNAMESE IMMIGRANTS

Thao Le - Corresponding Author

[redacted]

Master Candidate

San Jose State University

Marian K. Yoder

Professor RN. ED. D

School of Nursing – San Jose State University

Karen Ketner

Professor RN. MSN

School of Nursing – San Jose State University

Abstract

This was a non-experimental quantitative study using survey method to assess diabetic knowledge of 102 adult Vietnamese immigrants. The Health Belief Model provided the theoretical framework, and the 24-item diabetes knowledge questionnaire was adopted from the Starr County Texas study to use for this study. Data were categorized and analyzed using descriptive methods such as frequency and percentage. The findings indicated that lack of knowledge about diabetes was a significant issue among the Vietnamese immigrant population. Health care providers should develop an appropriate cultural educational program about diabetes to help the Vietnamese population to detect diabetes early and to control diabetes effectively.

Literature Review

With a population of 863,000 (US Census Bureau, 2002), Vietnamese Americans are one of the five largest Asian American ethnic groups in the United States. In Vietnam, few people have any knowledge about or understand diabetes, and their health problems are related to eating habits and food preferences. Vietnamese in America are thought to be at high risk for diabetes, but there is little population-based information about diabetes in Vietnamese-Americans.

Factors associated with living in the U.S. that place this population at high risk are: (a) not speaking English, (b) coping with stresses of the new life in America, (c) adapting to more sedentary lifestyles, and (d) eating a high calorie-diet with rice as a main dish of every meal. Tong (1991) studied the eating habits of 62 elderly from the Vietnamese Senior Citizens Association in the United States and reported that the majority of elderly still ate rice at both lunch and supper, and 94% did not snack. Lack of ability to speak English is a significant barrier for the Vietnamese immigrants to gain access to health care, to gain prompt diagnosis, to get education about diabetes, and to manage diabetes effectively.

In a study in Orange County California, it was found that an early symptom of diabetes, such as thirst, was minimally recognized in the local Vietnamese community (Mull, Nguyen, & Mull, 2001). In Houston, Texas, a telephone survey of 426 Vietnamese patients showed that 60% did not recognize increasing urinary frequency as an important symptom of diabetes (Baker, Calvert, Dols, Payne, & Reyes, 2000). One primary care physician in San Jose, California, reported that half of his Vietnamese patients had type II diabetes (as cited in Mull, Nguyen, & Mull, 2001). Yee (1997) also indicated that an improvement in knowledge about risks as well as symptom recognition of diabetes could be made for the Vietnamese elders. From another study in Southwest Houston, among Chinese and Vietnamese respectively, 34% and 54% could not

name any diabetic symptoms, 44% and 65% could not name any diabetic risk factors, and 52% and 34% thought that diabetes was preventable (Baker, Nguyen, & Dols, 2001). Lack of knowledge and awareness of diabetes contributed to missing diagnosis and treatment of diabetes among this population.

Vietnamese immigrants must understand the risks of diabetes, and health caregivers must know the level of client understanding to provide an appropriate educational program. The purpose of this study was to assess educational needs among the Vietnamese immigrants about diabetes and its complications.

Research Problem

Diabetes mellitus, mostly type 2 diabetes, is a serious and growing health problem in the United States. It was the sixth leading cause of death listed on U.S. death certificates in 1999 (Centers for Disease Control and Prevention, 2002). Approximately 16 million people in the United States currently have diabetes and suffer from its complications. This number will only continue to rise as the population grows and ages. In 2000, according to the United States Bureau of the Census (2001), the number of people who are diagnosed with diabetes in minority populations, including Asian Americans, American Indians and Pacific Islanders, is projected to double between 2002 and 2020. Health care spending in 2002 was double for people with diabetes compared with people without diabetes (American Diabetes Association, 2003).

Asians are thought to be at high risk for diabetes, yet there is little population-based information about diabetes in Asian Americans. A study by Ghosh (2003) showed that, in order to reach the healthy people 2010 goals and to have useful data, researchers and grant makers must focus on obtaining baseline data for disaggregated Asian American and Pacific Islander subgroups. National health data often are reported for Asians in the aggregate and do not monitor

the health of the Asian subpopulations such as Vietnamese and Cambodian (Centers for Disease Control and Prevention, 2004).

The rate of diabetic morbidity is increasing rapidly. People with diabetes are at higher risk for heart disease, stroke, high blood pressure, blindness, kidney failure, nervous system disease, extremity amputations, and other chronic conditions. Poor blood sugar control is an important predictor of amputation with noninsulin dependent diabetes mellitus (NIDMM) (Lehto, Ronnemaa, Pyorala, & Laakso, 1996). Diabetic patients, particularly women, are at high risk of death from stroke. The duration of diabetes is a very important factor (Tuomilehto, Rastenyte, Jousilahti, Sarti, & Vartiainen, 1996). Patients with end-stage renal disease and diabetes, regardless of type, will experience significantly poorer function than patients without diabetes (Hathaway, Cashion, Wicks, Milstead, & Gaber, 1998). Early symptom detection and effective control of diabetes would help to reduce the incidence of diabetes related complications. A study by Nagasawa, Smith, Barnes and Fincham (1992) showed that knowledge about diabetes played an important role in compliance. Therefore, research on knowledge about diabetes among the Vietnamese immigrants is needed to develop effective diabetic education programs.

Research Question

The research question was: "What are the perceptions of adult Vietnamese immigrants about diabetes and its complications?" The findings of the study will contribute to the knowledge base about diabetes and to identifying the educational needs of the Vietnamese population. It will help health care professionals to develop appropriate educational programs about diabetes. This is an important step to help this vulnerable population detect diabetes early and control diabetes effectively.

Conceptual Framework

The Health Belief Model (HBM) was the conceptual framework used in this study to explain health-promoting behaviors in relation to personal knowledge, values, and beliefs (Mikhail, 1984). Six key concepts of the HBM are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. Behavior change is dependent upon the values of a person with regard to a perceived health threat and a particular behavior. If a person fails to perceive the seriousness of diabetes, it can contribute to a lack of initiative to make lifestyle changes, particularly with type II diabetes also called non- insulin dependent diabetes mellitus (NIDDM). The perception of vulnerability to illness and efficacy of therapy are important determinants of preventive health behaviors. These perceptions are important predictors of adhering to a medical regimen for diabetes. If patients underestimate their risks for complications or the efficacy of treatment, they will not adhere to their treatment.

In a study by Daniel and Messer (2002), the Health Belief Model was evaluated for secondary prevention of type II diabetes mellitus in an Aboriginal population in British Columbia. The results indicated that perceived severity and perceived barriers were the best predictors of blood glucose status. Individual beliefs about barriers related to control and severity of diabetic complications were important factors influencing the ability of Aboriginal people with diabetes to achieve control of blood glucose. In another study by Dietrich (1996), participants reported that when diabetic complications started, compliance to a treatment plan improved. Difficulties in adhering to a diabetic treatment plan, lack of family support, and lack of knowledge about diabetes and its complications were the main factors contributing to noncompliance.

Language barriers, diet patterns and cultural practices were strongly related to health behaviors. Lack of ability to speak English and eating a high-calorie diet with rice as a main dish for meals are barriers for Vietnamese immigrants. Perceiving susceptibility would increase a person's awareness of risk factors to getting the disease. Perceiving the severity of diabetes and its consequences would motivate people to initiate lifestyle changes and to follow treatments. Knowledge about type II diabetes would help the Vietnamese immigrants to understand that they are at risk of having diabetes. Compliant behaviors would increase with the amount of knowledge that the patients acquire. The more people know about the disease, the more likely they would be to develop strong attitudes toward diabetes and positive self-care for a better quality of life.

Methodology

This was a non-experimental quantitative study using the survey method to determine diabetes-related knowledge among the Vietnamese immigrant population. This study assessed knowledge about causes, symptoms, treatments, diet, exercise, and diabetic complications that could more effectively provide detection and self-management of diabetes.

Instrument Development

This survey study, with a sample of 102 adult Vietnamese immigrants over 18 years old, was conducted in Santa Clara County, California, with a population in 2000 of approximately 99, 986 Vietnamese (U.S. Census Bureau, 2001). Two instruments were used in this study: (a) a short version 24-item Diabetes Knowledge Questionnaire (DKQ-24) from the Starr County Texas diabetes education study (Garcia, Villagomez, Brown, Kouzekanani, & Hanis, 2001) (See appendix A), and (b) the demographic questionnaire designed by the researcher (See appendix B).

The original 60-item DKQ was administered to 502 adult Mexican-Americans with type II diabetes who were part of the Starr County Diabetes Education Study (Garcia et al., 2001). Each item was stated in both Spanish and English. The responses were given in a format of "Yes," "No," or "I don't know." A shortened 24-item DKQ was derived from the original instrument after data collection was completed. It attained a reliability coefficient of 0.78 indicating consistency, sensitivity to the intervention, and suggesting construct validation. The DKQ-24 was determined to be a reliable, valid and relatively easy-to-use instrument to measure general diabetes knowledge, particularly for individuals who spoke a language other than English.

Permission to translate the DKQ-24 into Vietnamese and to use it in this study was obtained from A. Garcia (Garcia et al., 2001). The DKQ-24, the demographic questionnaire, and an informed consent were translated into Vietnamese by certified translators from Worldlingo Translation Globalization service. The backward translation also was done independently and was validated by certified translators. These instruments were provided in two languages: English and Vietnamese. The language of the informed consent was at a reading level of no greater than 8th grade for adults, and the use of technical research language was avoided.

Participants and Settings

The participants were recruited from a multi-service community center and a Buddhist cultural center in San Jose, California. Participants were asked to answer a demographic questionnaire and a 24-item diabetes knowledge questionnaire. If they were not able to read, the investigator conducted an oral survey with the demographic questionnaire and the DKQ-24. The investigator of the study was a native speaker of Vietnamese.

Data Collection

At the multi-service community center, subjects were recruited from three locations: English classrooms, a blood pressure clinic and the cafeteria. In the English classroom, the investigator distributed the questionnaires at the end of the classes and answered questions from the groups. In the blood pressure clinic, the questionnaires were distributed to individuals who came to the clinic to get their blood pressure checked. In the cafeteria, the researcher circulated among the clients during lunchtime to recruit participants.

At the Buddhist cultural center, the investigator set up a table to provide information about the study and gave the questionnaire individually to those who wished to participate in the study. Although 220 questionnaires with consent forms were distributed to the Vietnamese population, 102 questionnaires were returned with the consent signed.

Benefits and Confidentiality of Participants

The study was not expected to benefit the participants directly nor the community centers. However, exposure to the survey information could increase the participants' awareness of diabetes. There was no known risk to participants in the study. Each participant received a one-dollar lottery ticket as a thank-you gift.

Subjects were not anonymous, but anonymity was maintained in reporting results. The collected materials were reviewed by the researcher and two advisers, and they were stored in a locked cabinet in the home of the researcher. Confidentiality of individual participants was protected.

Data Analyses

Data were categorized and analyzed using descriptive methods such as frequency and percentage. The returned questionnaires were examined for completeness, and the data were

calculated using Excel software. There were many omitted answers from the questionnaires. The reasons that participants omitted questions might be because they were informed in the consent that they could decline to answer any questions or withdraw at anytime. As the results, findings for some items did not add up 100%. Analysis was based on responses of 102 participants, and not all of the participants had diabetes.

Responses from the 24-item DKQ were divided in four categories: (a) causes of diabetes, (b) signs and symptoms, (c) testing and treatment, and (d) complications. The analysis of correct responses is presented on three tables. Table 1 shows the responses about causes, signs and symptoms of diabetes. Table 2 shows the responses regarding diabetic testing and treatment. Table 3 shows the responses about complications of diabetes.

Findings

The findings will be described here in three sections: (a) demographics, (b) objective data, and (c) subjective data from random, informal conversations with participants.

Demographic Data

The majority of the participants were male (57.8%), and 42.2% were female. Vietnamese was the primary language of all participants, and only 46% were able to speak or read English. Most were not able to speak or read English, or they spoke only a little English (54%). Although this population was selected because it was known to be a group at high risk of having diabetes, 62.7% of the participants claimed not to have diabetes nor friends or family members with diabetes. Only 20.6% indicated that they have diabetes, and 16.7% reported that they did not have diabetes but had friends or family members with diabetes.

Objective Data

The participants (N=102) were divided into three groups: (a) participants with diabetes (20.6%, n=21), (b) participants without diabetes but who had friends or family members with diabetes (16.7%, n=17), and (c) participants without diabetes and who did not have friends or family members with diabetes (62.7%, n=64). Tables 1, 2 and 3 show the cumulative responses from the study group.

As illustrated in Table 1, many participants lacked knowledge about the causes and signs and symptoms of diabetes. Most (77.4%) believed that eating too much sugar and other foods would cause diabetes, and 65.7% misunderstood that diabetes was caused by failure of the kidney to keep sugar out of the urine. Many (34%) did not know that their children would have a higher risk of diabetes if the parent had diabetes, and 66.6% did not know that there were two types of diabetes, insulin dependent and non-insulin dependent. The majority of participants (80%) did not recognize signs and symptoms of diabetes.

Responses also revealed that the participants were unaware of diagnosis and treatment of diabetes (See Table 2). Half of the participants (50%) believed that diabetes could be cured, and more than half (62.7%) believed the way to check diabetes was by testing the urine. In addition, 64% believed that regular exercise increases the need for insulin or other diabetic medication. A large majority of the participants (75.5%) believed that a diabetic diet consisted mostly of special foods.

Many did not know about diabetic complications. Sixty-five per cent lacked information about the care of cuts (See Table 3). Twenty-five per cent of the participants did not know that diabetes could cause poor circulation, and only 18.7% knew that tight elastic hose and socks were bad for diabetes.

The findings of this study, with 102 participants, were consistent with the results of previous studies on diabetes. In a study of Mull, Nguyen, and Mull (2001), early symptoms of diabetes, such as thirst, were minimally recognized in the local Vietnamese community. Sixty per cent of participants did not recognize that increasing urinary frequency was an important symptom of diabetes (Baker et al., 2000). From another random phone survey conducted in 849 Chinese and Vietnamese households in Southwest Houston (a survey that was done in the participants' native language), 54% of the Vietnamese could not name any diabetic symptoms, 65% could not name any diabetic risk factors, and 34% thought that diabetes was preventable (Baker, Nguyen, & Dols, 2001). The result of this study again indicated that lack of knowledge of diabetes was a significant issue among the Vietnamese immigrant population.

Subjective Data

The informal interviews and discussions, that occurred when the researcher attempted to obtain consent of the Vietnamese to participate in the study, revealed very interesting findings. Clients were reluctant to participate in the survey when their signature was requested on the consent form. Although many clients agreed to participate because they were given a $1.00 lottery ticket as a thank-you gift, the return rate of the signed consent form and questionnaire was less than 50% (102 out of the 220 distributed). The survey was conducted 2 weeks after the Vietnamese New Year when the cultural belief is that it is good luck to receive money or a lottery ticket. Some participants asked to be a part of the study in order to receive the lottery ticket. In some cases, the individual would accept the questionnaire with the lottery ticket, put the lottery ticket away, and decline to participate when asked to sign the consent form. Clients were afraid of revealing their identities, and some expressed that they did not want anybody to know that they were sick. Others accepted the questionnaire for return later but never returned it.

The individuals showed an increase of confidence and trust, and they were more open and willing to talk to the researcher at a Vietnamese community center where the researcher received an introduction by employees of that center.

In some cases, the researcher was able to have informal conversations with the clients who returned the questionnaires. These conversations revealed that the clients did not have, or had very little, knowledge about diabetes. However, there were positive responses on their surveys indicating they had knowledge about diabetes. The participants did not want to admit that they did not know the answers to the questions, so instead of responding "don't know," the researcher observed that some participants grouped themselves and discussed the questions to decide on a common answer. Inconsistency of responses indicated that some answers were a guess.

The researcher encountered many more clients with diabetes than the objective data indicated. The informal conversations revealed that the clients had taken medication for diabetes in the past, but they were currently on dietary control. However, some of these participants responded on the questionnaire that they did not have diabetes because they believed that they did not have diabetes anymore. Others said that they would see ants attracted to the urine or on dirty underwear if they really had diabetes because of the belief that sugar in urine attracted ants. Most of the participants verbally expressed that their cuts and abrasions healed slowly and that they took extra care when cutting their toenails. However, they did not do this because they had diabetes but rather because cultural beliefs about aging that the body got old and it was a logical thing for everybody to do.

Limitations

The non-random population for this study may be a limitation to generalization of the findings to all Vietnamese clients. Although the researcher believes this number is not accurate, 62.7% of the participants in this study about knowledge of diabetes denied having diabetes or having friends or family with the disease. The study could also be biased because it was taken in one local community of Vietnamese clients who probably shared the same cultural beliefs.

Conclusions and Recommendations

Discussion and Nursing Implication

The purpose of this study was to assess educational needs among the Vietnamese immigrants about diabetes and its complications. The findings of this study were consistent with the results of previous studies on diabetes. This study highlights the educational needs about causes, basic symptoms, testing, treatments, and complications of diabetes among the Vietnamese immigrant population. These results are similar to other studies (Baker et al., 2000; Baker, Nguyen, & Dols, 2001; Mull, Nguyen, & Mull, 2001). If there had been no informal conversation, this research would agree with the other research in the literature. It was the informal conversations with the participants that revealed the surprising results that have not been recorded in the literature.

Understanding an individual's level of knowledge about diabetes is helpful to the nurse who wishes to promote a healthy life style for a diabetic client in the Vietnamese culture. Based on the results of this study, the nurse should not automatically accept that the client understands the signs and symptoms of diabetes or the importance of the behavioral changes consistent with a healthy lifestyle for the diabetic individual. Health care providers should develop an appropriate

cultural educational program about diabetes which would be an important step to help the Vietnamese population to detect diabetes early and to control diabetes effectively. Health care providers should be able to identify signs of denial such as trying to hide the problems associated with diabetes. Fear of the diabetes diagnosis may be due to lack of diabetic knowledge. Awareness of diabetes plays an important role in the diagnosis and control of the disease.

Recommendations for Health Promotion

Health care providers should provide a diabetic educational program that starts with basic information about diabetes such as signs and symptoms, testing for diabetes, as well as diet and exercise. The information could be presented in a pamphlet that is written in the native language.

Recommendations for Further Study

A recommendation for further study is to replicate the study in a larger sample of Vietnamese clients. A true random sample would yield more valid results. As indicated from the informal findings about the beliefs of Vietnamese immigrants, replication of the study using individual interviews would be beneficial in establishing reliability of the results. In addition, a replication using a different cultural group as the population could provide valuable data. A longitudinal study design to study diabetes over a long term could be helpful to health care providers who want to plan the most effective educational program.

Conclusions

Based on the 24-item diabetes knowledge questionnaire tool, this study found that many adult Vietnamese immigrants do not know (or know only a little) about the causes, signs and symptoms, testing and treatment of diabetes. However, the readers should also be aware of the results of the informal conversations with the participants. The information obtained from informal conversations did not always agree with the responses recorded on the survey. Building

trust and confidence between health care providers and clients plays an important role in diabetic assessment and interventions.

This may have been yet another diabetic replication study on the knowledge of diabetes, but it raises the question of whether the literature data is reliable. Further research is needed to establish the survey questionnaire as a reliable research tool among the Vietnamese population. This study has shown the importance of evaluating the learner's perceptions in an educational program for diabetes. Providing information and knowledge about diabetes is an important task that helps to prevent the onset of diabetes, promote early diagnosis, and improve the treatment and outcomes for patients with diabetes. From this study, it is evident that there is a need to educate the Vietnamese population about diabetes in order to create awareness and help in the prevention of this disease. The Vietnamese community and health care providers need to provide an appropriate cultural educational program about diabetes to help the Vietnamese population to detect diabetes early and to control diabetes effectively.

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Table 1
Responses about causes, signs and symptoms of diabetes

DKQ Item #	Questions	% Correct	% Wrong	% Don't Know	% Omitted Question
1	Eating too much sugar and other sweet food will cause diabetes	13.73	77.45	8.82	0
2	The usual cause of diabetes is lack of effective insulin in the body	47.06	10.78	35.29	6.86
3	Diabetes is caused by failure of the kidney to keep sugar out of the urine	5.88	65.69	21.57	6.86
4	Kidney produce insulin	7.84	33.33	51.96	6.86
6	If I am diabetic, my children have a higher chance of being diabetic	61.76	3.92	30.39	3.92
11	There are two main types of diabetes: Type I (Insulin-Dependent) and Type II (Non-Insulin-Dependent)	25.49	2.94	63.73	7.84
21	Shaking and sweating are signs of high blood sugar	16.7	45.1	33.33	4.9
22	Frequent urination and thirst are signs of low blood sugar	10.78	44.12	40.2	4.9

Table 2
Responses about diabetic testing and treatment

DKQ Item #	Questions	% Correct	% Wrong	% Don't Know	% Omitted Question
5	If untreated diabetes, the amount of sugar in the blood usually increases	86.27	0.98	8.82	3.92
7	Diabetes can be cured	32.35	50	16.67	0.98
8	A fasting blood sugar level 210 is too high	64.71	1.96	29.41	3.92
9	The best way to check my diabetes is by testing my urine	11.76	62.75	23.53	1.96
10	Regular exercise will increase the need for insulin or other diabetic medication	6.86	64.71	23.53	4.9
12	An insulin reaction is caused by too much food	16.67	45.1	32.35	5.88
13	Medication is more important than diet and exercise to control my diabetes	47.6	34.31	13.73	4.9
18	The way I prepare food is as important as the food I eat	79.41	4.9	11.76	3.92
24	A diabetic diet consists mostly of special food	8.82	75.49	14.71	0.98

Table 3
Responses about complications of diabetes

DKQ Item #	Questions	% Correct	% Wrong	% Don't Know	% Omitted Question
14	Diabetes often causes poor circulation	54.9	11.76	25.49	7.84
15	Cuts and abrasions on diabetes heal more slowly	80.39	1.96	12.75	4.9
16	Diabetics should take extra care when cutting their toenails	71.57	6.86	16.67	4.9
17	A person with diabetes should clean a cut with iodine and alcohol	0	65.69	28.43	5.88
19	Diabetes can damage my kidneys	63.73	2.94	25.49	7.84
20	Diabetes can cause loss of feeling in my hand, fingers, and feet	66.67	5.88	22.55	4.9
23	Tight elastic hose and socks are not bad for diabetes	18.63	38.24	37.25	5.88

APPENDIX A

The 24-item Diabetes Knowledge Questionnaire

Item #	Questions	Yes	No	Don't Know
1	Eating too much sugar and other sweet food will cause diabetes		x	
2	The usual cause of diabetes is lack of effective insulin in the body	x		
3	Diabetes is caused by failure of the kidneys to keep sugar out of the urine		x	
4	Kidneys produce insulin		x	
5	If untreated diabetes, the amount of sugar in the blood usually increases	x		
6	If I am diabetic, my children have a higher chance of being diabetic.	x		
7	Diabetes can be cured		x	
8	A fasting blood sugar level 210 is too high	x		
9	The best way to check my diabetes is by testing my urine.		x	
10	Regular exercise will increase the need for insulin or other diabetic medication.		x	
11	There are two main types of diabetes: Type I (Insulin-Dependent) and Type II (Non-Insulin-Dependent).	x		
12	An insulin reaction is caused by too much food.		x	
13	Medication is more important than diet and exercise to control my diabetes.		x	
14	Diabetes often causes poor circulation.	x		
15	Cuts and abrasions on diabetics heal more slowly.	x		
16	Diabetics should take extra care when cutting their toenails.	x		
17	A person with diabetes should clean a cut with iodine and alcohol.		x	
18	The way I prepare my food is as important as the food I eat.	x		

Item #	Questions	Yes	No	Don't Know
19	Diabetes can damage my kidneys	x		
20	Diabetes can cause loss of feeling in my hand, fingers, and feet.	x		
21	Shaking and sweating are signs of high blood sugar.		x	
22	Frequent urination and thirst are signs of low blood sugar.		x	
23	Tight elastic hose and socks are not bad for diabetes		x	
24	A diabetic diet consists mostly of special foods.		x	

Bảng 24 câu hỏi kiến thức về bệnh tiểu đường

Số	Câu hỏi	Đúng	Không đúng	Không biết
1	Ăn quá nhiều đường và thức ăn ngọt khác sẽ gây tiểu đường.		x	
2	Nguyên nhân thông thường dẫn đến tiểu đường là thiếu insulin thực tế trong cơ thể.	x		
3	Tiểu đường là do thận không lọc được đường ra khỏi nước tiểu.		x	
4	Thận tạo ra insulin.		x	
5	Nếu bệnh tiểu đường không được điều trị, lượng đường trong máu thường tăng.	x		
6	Nếu tôi bị tiểu đường, các con tôi sẽ có nguy cơ mắc tiểu đường cao hơn.	x		
7	Bệnh tiểu đường có thể chữa được.		x	
8	Mức đường trong máu lúc đói 210 là quá cao.	x		
9	Cách tốt nhất để kiểm tra tiểu đường là xét nghiệm nước tiểu.		x	
10	Tập thể dục thường xuyên sẽ làm tăng nhu cầu insulin hoặc các thuốc điều trị tiểu đường khác.		x	
11	Có 2 loại bệnh tiểu đường chính: Loại I (Phụ thuộc vào Insulin) và Loại II (Không phụ thuộc vào Insulin).	x		
12	Ăn quá nhiều thức ăn sẽ gây ra một phản ứng insulin.		x	
13	Dùng thuốc quan trọng hơn ăn kiêng và tập thể dục trong việc kiểm soát bệnh tiểu đường.		x	
14	Bệnh tiểu đường thường làm chức năng tuần hoàn kém.	x		
15	Vết cắt hoặc trầy da của người bị bệnh tiểu đường lành lại chậm hơn.	x		
16	Người bị bệnh tiểu đường cần phải cẩn thận hơn khi cắt móng chân	x		
17	Một người bị bệnh tiểu đường cần phải rửa vết cắt bằng i-ốt và cồn.		x	
18	Cách tôi chuẩn bị thức ăn là quan trọng như là thức ăn tôi ăn.	x		

19	Bệnh tiểu đường có thể làm hỏng thận của tôi.	x	
20	Bệnh tiểu đường có thể gây mất cảm giác ở tay, ngón tay và chân.	x	
21	Run và ra mồ hôi là những dấu hiệu của lượng đường trong máu cao.		x
22	Tiểu tiện và khát nước thường xuyên là những dấu hiệu của lượng đường trong máu thấp.		x
23	Quần tất và bít tất co giãn chật là không xấu đối với bệnh tiểu đường.		x
24	Bữa ăn kiêng của người bị bệnh tiểu đường chủ yếu bao gồm các thức ăn đặc biệt.		x

APPENDIX A

The 24-item Diabetes Knowledge Questionnaire

Item #	Questions	Yes	No	Don't Know
1	Eating too much sugar and other sweet food will cause diabetes		x	
2	The usual cause of diabetes is lack of effective insulin in the body	x		
3	Diabetes is caused by failure of the kidneys to keep sugar out of the urine		x	
4	Kidneys produce insulin		x	
5	If untreated diabetes, the amount of sugar in the blood usually increases	x		
6	If I am diabetic, my children have a higher chance of being diabetic.	x		
7	Diabetes can be cured		x	
8	A fasting blood sugar level 210 is too high	x		
9	The best way to check my diabetes is by testing my urine.		x	
10	Regular exercise will increase the need for insulin or other diabetic medication.		x	
11	There are two main types of diabetes: Type I (Insulin-Dependent) and Type II (Non-Insulin-Dependent).	x		
12	An insulin reaction is caused by too much food.		x	
13	Medication is more important than diet and exercise to control my diabetes.		x	
14	Diabetes often causes poor circulation.	x		
15	Cuts and abrasions on diabetics heal more slowly.	x		
16	Diabetics should take extra care when cutting their toenails.	x		
17	A person with diabetes should clean a cut with iodine and alcohol.		x	
18	The way I prepare my food is as important as the food I eat.	x		

Item #	Questions	Yes	No	Don't Know
19	Diabetes can damage my kidneys	x		
20	Diabetes can cause loss of feeling in my hand, fingers, and feet.	x		
21	Shaking and sweating are signs of high blood sugar.		x	
22	Frequent urination and thirst are signs of low blood sugar.		x	
23	Tight elastic hose and socks are not bad for diabetes		x	
24	A diabetic diet consists mostly of special foods.		x	

Bảng 24 câu hỏi kiến thức về bệnh tiểu đường

Số	Câu hỏi	Đúng	Không đúng	Không biết
1	Ăn quá nhiều đường và thức ăn ngọt khác sẽ gây tiểu đường.		x	
2	Nguyên nhân thông thường dẫn đến tiểu đường là thiếu insulin thực tế trong cơ thể.	x		
3	Tiểu đường là do thận không lọc được đường ra khỏi nước tiểu.		x	
4	Thận tạo ra insulin.		x	
5	Nếu bệnh tiểu đường không được điều trị, lượng đường trong máu thường tăng.	x		
6	Nếu tôi bị tiểu đường, các con tôi sẽ có nguy cơ mắc tiểu đường cao hơn.	x		
7	Bệnh tiểu đường có thể chữa được.		x	
8	Mức đường trong máu lúc đói 210 là quá cao.	x		
9	Cách tốt nhất để kiểm tra tiểu đường là xét nghiệm nước tiểu.		x	
10	Tập thể dục thường xuyên sẽ làm tăng nhu cầu insulin hoặc các thuốc điều trị tiểu đường khác.		x	
11	Có 2 loại bệnh tiểu đường chính: Loại I (Phụ thuộc vào Insulin) và Loại II (Không phụ thuộc vào Insulin).	x		
12	Ăn quá nhiều thức ăn sẽ gây ra một phản ứng insulin.		x	
13	Dùng thuốc quan trọng hơn ăn kiêng và tập thể dục trong việc kiểm soát bệnh tiểu đường.		x	
14	Bệnh tiểu đường thường làm chức năng tuần hoàn kém.	x		
15	Vết cắt hoặc trầy da của người bị bệnh tiểu đường lành lại chậm hơn.	x		
16	Người bị bệnh tiểu đường cần phải cẩn thận hơn khi cắt móng chân	x		
17	Một người bị bệnh tiểu đường cần phải rửa vết cắt bằng i-ốt và cồn.		x	
18	Cách tôi chuẩn bị thức ăn là quan trọng như là thức ăn tôi ăn.	x		

19	Bệnh tiểu đường có thể làm hỏng thận của tôi.	x	
20	Bệnh tiểu đường có thể gây mất cảm giác ở tay, ngón tay và chân.	x	
21	Run và ra mồ hôi là những dấu hiệu của lượng đường trong máu cao.		x
22	Tiểu tiện và khát nước thường xuyên là những dấu hiệu của lượng đường trong máu thấp.		x
23	Quần tất và bít tất co giãn chật là không xấu đối với bệnh tiểu đường.		x
24	Bữa ăn kiêng của người bị bệnh tiểu đường chủ yếu bao gồm các thức ăn đặc biệt.		x

APPENDIX B

Demographic Questionnaire
(Please circle your answers)

Gender: Male Female

Age: 18-24 25-35 36-45 46-55 56-65 More than 65

Years in the U.S.:

0 – 5 yrs 6 – 10 yrs More than 10 yrs

Able to speak English: None or a little Yes

Able to read Vietnamese None or a little Yes

Able to read English: None or a little Yes

Ever been screen for diabetes: Yes No Not sure

Have friends or family members with diabetes: Yes No Not sure

Years of having diabetes:

None Less than 1 yr Less than 3 yrs 3 – 5 yrs

5 –10 yrs More than 10 yrs

Diabetes treatment:

Diet only Oral agent Insulin Oral agent and Insulin

Câu hỏi thăm dò
(Hãy khoanh tròn câu trả lời)

Giới tính: Nam Nữ

Tuổi: 18-24 25-35 36-45 46-55 56-65 Trên 65

Số năm ở Mỹ:

0 -5 năm 6-10 năm Hơn 10 năm

Khả năng nói tiếng Anh: Không có hoặc có ít Có

Khả năng đọc tiếng Việt Không Có

Khả năng đọc tiếng Anh: Không có hoặc có ít Có

Đã được khám bệnh tiểu đường chưa: Đã Chưa Không chắc

Có bạn hoặc người thân trong gia đình bị tiểu đường: Có Không Không chắc

Số năm mắc bệnh tiểu đường:

Không mắc Dưới 1 năm Dưới 3 năm 3-5 năm

5-10 năm Hơn 10 năm

Điều trị tiểu đường:

Chỉ ăn kiêng Thuốc uống Insulin Thuốc uống và Insulin

APPENDIX B

Demographic Questionnaire
(Please circle your answers)

Gender: Male Female

Age: 18-24 25-35 36-45 46-55 56-65 More than 65

Years in the U.S.:

0 – 5 yrs 6 – 10 yrs More than 10 yrs

Able to speak English: None or a little Yes

Able to read Vietnamese None or a little Yes

Able to read English: None or a little Yes

Ever been screen for diabetes: Yes No Not sure

Have friends or family members with diabetes: Yes No Not sure

Years of having diabetes:

None Less than 1 yr Less than 3 yrs 3 – 5 yrs

5 –10 yrs More than 10 yrs

Diabetes treatment:

Diet only Oral agent Insulin Oral agent and Insulin

Câu hỏi thăm dò
(Hãy khoanh tròn câu trả lời)

Giới tính: Nam Nữ

Tuổi: 18-24 25-35 36-45 46-55 56-65 Trên 65

Số năm ở Mỹ:

0 -5 năm 6-10 năm Hơn 10 năm

Khả năng nói tiếng Anh: Không có hoặc có ít Có

Khả năng đọc tiếng Việt Không Có

Khả năng đọc tiếng Anh: Không có hoặc có ít Có

Đã được khám bệnh tiểu đường chưa: Đã Chưa Không chắc

Có bạn hoặc người thân trong gia đình bị tiểu đường: Có Không Không chắc

Số năm mắc bệnh tiểu đường:

Không mắc Dưới 1 năm Dưới 3 năm 3-5 năm

5-10 năm Hơn 10 năm

Điều trị tiểu đường:

Chỉ ăn kiêng Thuốc uống Insulin Thuốc uống và Insulin