Diabetes Education and Diabetes Prevention Education Needs Assessment, Las Vegas, Nevada

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Introduction

National efforts regarding diabetes care, that intend to reduce complications of diabetes through behavior and life skills, target persons who are already diagnosed with the disease. Not enough efforts have been focused on preventing diabetes onset; and thus prevalence of the disease continues rising at alarming rates, often referred to as an epidemic.

In 2007, 23.5 million people or 10.7% of the adults over the age of 20 in the United States have diagnosed and undiagnosed diabetes (CDC 2008). Just in the state of Nevada, 217,467 (8%) adults age 18 years or older reported having diabetes (NDC 2008). In Clark County, prevalence of diabetes is up to 8.5% of adults age 18 years or older. In particular, low income adults have the highest prevalence of diabetes, 21.1% of households with annual incomes of less than $25,000, compared to those with household with incomes greater than $35,000, 14.2% (NDC 2008).

Costs of health care and related treatments for diabetes also continue rising. In 2005, it cost Nevada $100 million for diabetes health care and related treatments; of this, only $19.3 million was reimbursed by Medicaid (NDC 2008). In 2002, diabetes cost the State of Nevada $82,030,607 in hospitalizations for Nevada residents with diabetes (NSHD 2005). Furthermore, the latest study on the economic burden of diabetes in the country found that costs of diabetes in 2007 exceeded $174 billion in health care resources to treat diabetes and its comorbidities (ADA 2008).

CDC prevalence estimates show that diabetes is more common among Hispanics in the United States; 10.4% of Hispanics have diabetes, compared to 6.6% of non-Hispanic whites, 7.5% of Asian Americans and non-Hispanic blacks also have a high prevalence

of the disease, 11.8% (CDC 2008). Clark County Nevada has a high percentage of Hispanics, 27.2%, compared to the national average, 14.7% (Census 2009). Over the last six years, Las Vegas, Nevada is also the fourth fastest growing television household among Hispanic Markets in the country, raking higher than Phoenix, Houston and Chicago (Gordon 2007), and Nevada also ranked seventh for percent change in the Latino population from 2000 to 2006 (Census 2009). Ten zip codes in Las Vegas also have a high percentage of Hispanic density, from 33 to 73 percent of the population (Gordon 2007). Compared to other ethnicities in Clark County, Nevada, 38.8% of students enrolled in the Clark County School District are Hispanic, making this group the largest ethnic group enrolled (Gordon 2007).

There is a lack of effective diabetes prevention interventions targeting behavior changes for diabetes risk reduction both nationally and locally. This needs assessment focuses on the needs of diabetes prevention in the Las Vegas. Particular attention to the Hispanic community is of interest due to the high prevalence of the disease in this ethnic group and large size of this population in this urban community.

Objective

This needs assessment has two objectives: 1) to understand needs and identify gaps in diabetes prevention and education programs and 2) to determine the need of diabetes prevention programs in high-risk communities, of special interest is the Hispanic community, throughout the Las Vegas by conducting structured interviews with key agencies.

Method

Purposive sampling of key agencies in the community that serve Hispanic and underserved populations was used to collect needs data via structured interviews with open ended questions. Frequency data from An Ounce of Prevention was analyzed to determine success of diabetes risk reduction behaviors in the Hispanic community in Las Vegas.

Agencies Interviewed

Selected agencies consisted of diabetes education centers, hospitals, insurance companies, state agencies, county agencies, local community centers/agencies and local health care providers. A total of 18 agencies participated in the needs assessment.

Structured Interviews

Interview questions were developed to assess the needs of the community. The following basic needs questions guided the interview: 1) if the agency serves Hispanic or other high-risk populations for diabetes, 2) if the agency addresses diabetes prevention, 3) if the agency implements a diabetes risk assessment tool and 4) if the agency provides diabetes prevention education that evaluates behavior change. The structured interview questions were created to assess many types of agency that are available to the community. See **Table 1** for summary and association between objectives, basic needs questions and interview questions.

Table 1. Relationship of objectives to the basic needs questions and interview questions.

Objectives	Basic Needs Questions	Interview Questions
1) To understand needs and identify gaps in diabetes prevention and education programs.	1) Does the agency serve Hispanic or other high-risk populations for diabetes?	• What is the ethnic/racial breakdown of your clients? (*If they do not serve Hispanics, thank them and don't bother asking the remaining questions.)* • How many of the clients you serve are low-income? • Do you serve uninsured clients? • What types of medical insurance do your clients have?
	2) Does the agency implement a diabetes risk assessment tool?	• Do you have a method to asses if your clients/patients are at risk for diabetes?
	3) Does the agency address diabetes prevention?	• How many clients/patients/families does your agency serve? • What kind of health educational services do you offer? • What other agencies that your clients use offer similar services? • Do you provide education to those clients/patients at risk for diabetes? Probes: If so, what kind of education is provided to prevent diabetes? (Classes, pamphlets, consultations, etc.) Who provides the information?
2) To determine the need of diabetes prevention programs in high-risk communities.	4) Does the agency provide diabetes prevention education that evaluates behavior change?	• Do you serve clients in need of diabetes and or diabetes prevention education? • How often do you offer any diabetes education? Probes: If so, what kind of education is provided to diabetes management? (Classes, pamphlets, consultations, etc.) Who provides the information?

Data Analysis

Data collected from structured interviews was categorized into basic needs questions and objectives by coding answers using qualitative data analysis technique. Chi-square test was used to compare changes in behavior before and after completing the six classes using a Post-Pre test for An Ounce of Prevention, currently the only diabetes prevention program tracking changes in behavior. The chi-square analysis for this paper was generated using SAS Software Version 9.1.3.

Results

Date collection from 18 agencies was included. Of these 18 agencies, only one was a free service to patients which was funded by a pharmaceutical company. Only one hospital offers free comprehensive diabetes education, taught by a team of registered dietitians, pharmacists and nurses, to anyone who wants to attend. All other programs have out of pocket fees or patient's insurance to cover costs. Characteristics of participating agencies are summarized in **Table 2**. Although the diabetes education centers and hospitals offer diabetes prevention education, it is mostly to patients who pay out of pocket or get doctor referrals, and there is no distinction of information between diabetes prevention and diabetes self-management education.

Table 2. Characteristics of agencies interviewed.

Agency Type	**n = 18**	**Latino/Hispanic Clients Served Annually** *(approximate figures for 2008)*	**Offer services specifically on diabetes**	**Number of Centers used by community and located in Zip Codes with High Hispanic Density**
Diabetes Education Centers	4	526	4	2
Hospitals	2	198	2	1
Insurance Companies	2	NA	2	NA
County Agencies	5	2,784*	2	2
Local Community Centers or Agencies	2	150,640	0	1
Local Health Care Providers	2	2,610**	1	2
Pharmaceutical Funded Program	1	1,690	1	1

*Numbers are based on 2 of 4 agencies who were able to provide ethnic breakdown.
**Numbers are based on 1 of 2 agencies who was able to provide ethnic breakdown.
NA = information not available

Table 3. Comparison of Diabetes Education in the state/county and the national level.

County and National Diabetes Description	**National**	**Las Vegas, NV**
Total Population	306 million	1,836,333
Percent of Hispanic Population	14.8%	25.7%
Percent of Population with Diabetes	7.8%	(217,468) 8.5%*
Percent Hispanic population with diabetes	10.4%	6.0%*
Percent persons attending Diabetes Education	57.7%**	57.0%**
		(6,941) 3.2%***
Hispanic persons Attending Diabetes Education	NA	(725) 10.4%***

* Only data for state available
** Behavioral Risk Factor Surveillance System

***Estimate based on needs assessment data for 2008 only

Table 3 depicts demographic information regarding population with diabetes and those who attended diabetes education in 2008 in Las Vegas, Nevada and nationally. There is a slightly larger percentage of persons with diabetes in Las Vegas, Nevada compared to the national average, and there is a slightly lower percentage of persons attending diabetes education based on the Behavioral Risk Factor Surveillance System that collected data from 2000-2006. Based on estimates collected from the key agencies interviewed, 3.2% of persons with diabetes attending diabetes education in 2008 and 10.4% of Hispanic persons with diabetes attended diabetes classes in Las Vegas. Comparison data for this ethnic group is not available at the national level. There may be more persons attending diabetes education locally as some of the agencies interviewed do not collect such information. This number may also be influenced by persons with health insurance, as uninsured do not receive the same diabetes self-management education and preventive services (Nelson, Chapko et al. 2000).

Diabetes risk assessment questionnaires and screening tools are readily available and easy to use. No agency interviewed currently has a formal survey or tracking system in place to assess participants, clients or patients for diabetes risk. Most screenings and assessments are done at health fairs and by referrals on an individual basis. The diabetes education centers usually only see persons who already have physician diagnosed diabetes. This is largely health insurance driven as health insurance will only pay for diabetes education only if the individual has been diagnosed by a physician. Diabetes prevention education is typically not covered by health insurance.

One of the interviewees of a local agency stated that some of the case workers that interact with participants have obtained the trust of these individuals and sometimes they feel comfortable sharing how they are feeling.

> *"If they tell us they have certain symptoms sometimes we can tell [if it is diabetes] and we refer [them] to a nurse from the health district and [they] refer further." ~local agency or community center*

The insurance companies expect doctors to asses their patients for diabetes risk.

> *"Doctors are to screen [patients] and we provide literature and newsletters weekly [to members]." ~insurance company*

Diabetes education centers do not conduct diabetes risk assessment at their clinics as the patients they see there are already diagnosed. All diabetes education centers had similar responses.

> *"No, they are already here. We have gotten them for situations already diagnosed." ~diabetes education center*

> *"[We] have screens from hospital, but at health fairs they get some labs done to assess risk." ~diabetes education center*

Among the participating agencies, there were 12 (diabetes education centers, hospitals, insurance companies, local health care providers and a pharmaceutical funded program) who serve persons with diagnosed diabetes and offer diabetes specific services, care or information. Although these agencies can also serve persons who do not have diabetes, they do not have a program that implements and tracks behavior change strategies to address diabetes prevention. The diabetes education centers offer diabetes prevention education or pre-diabetes education for an out of pocket cost, as most patients' insurance plans do not cover diabetes prevention education. Most

agencies did pass out literature, but this is not considered a teaching session as they did not explain it and they didn't track any behavior change as a result.

> *"We offer pre-diabetes classes [self-pay if their insurance doesn't cover it], free community talks [and] free health fairs. They get lectures, pamphlets, booklets and resources." ~diabetes education center*

> *"We provided diabetes prevention when requested by a doctor. They get literature and [we] encourage them to come to class." ~hospital.*

Only one of the agencies provided a diabetes education program that tracks behavior change. This program, An Ounce of Prevention, was taught in different community centers by a community based instructor from University of Nevada Cooperative Extension. Participants attend lessons once a week for six weeks taught by a community based instructor, and Post-Pre tests are completed by participants to allow tracking of behavior changes as a result of the lesson objectives. This program had a total of 220 participants complete the six lesson series, in 2008. Some of these participants were also obtaining other resources from the local community centers or agencies where they found out about the program.

An Ounce of Prevention has demonstrated successful education targeting behavior change. Findings from the Post-Pre tests from 2008 demonstrated a statistically significant improvement in knowledge and changes in behavior regarding diabetes prevention and diabetes risk factors displayed in **Table 4.** The program objectives are taught with a focus on behavior change recommendations to increase activity, watch less television, consumption of more fruits and vegetables and lower fat intake. **Table 4** depicts the significant changes in behavior reported from the Post-Pre tests. Participants reported eating more fruits and vegetables each day, trimming fat from meat before cooking, avoiding adding fat to foods and watching less television.

Changes in knowledge about diabetes and diabetes risk factors also had a significant change with more participants reporting a moderate amount of knowledge regarding the topics.

Table 4. Participant responses from Post-Pre tests.

Questions **Answers**	**Pre-Test** Frequency	**%**	**Post-Test** **Frequency**	**%**	***P****
I eat five servings of fruits/vegetables each day?	n=220		n=220		
Almost never	102	23.18	0	0	
Seldom	49	11.14	4	.91	
About half the time	33	7.5	19	4.32	
Often	22	5	87	19.77	
Almost always	**14**	**3.18**	**110**	**25**	**<.0001**
I eat fried food regularly?	n=220		n=219		
Almost never	15	3.42	71	16.17	
Seldom	**33**	**7.52**	**125**	**28.47**	**<.0001**
About half the time	28	6.38	14	3.19	
Often	73	16.63	4	.91	
Almost always	71	16.17	5	1.14	
I bake or broil meat, chicken and/or fish?	n=220		n=220		
Almost never	63	14.32	2	.45	
Seldom	87	19.77	9	2.05	
About half the time	26	5.91	18	4.09	
Often	25	5.68	89	20.23	
Almost always	**19**	**4.32**	**102**	**23.18**	**<.0001**
I include physical activity most days?	n=218		n=220		
Almost never	28	14.16	0	0	
Seldom	77	17.58	10	2.28	
About half the time	29	6.62	22	5.02	
Often	**22**	**5.02**	**63**	**28.54**	**<.0001**
Almost always	28	6.39	125	14.38	
I spend two hours or more each day watching TV?	n=220		n=219		
Almost never	29	6.61	69	15.72	
Seldom	**34**	**7.74**	**124**	**28.25**	**<.0001**
About half the time	12	2.73	10	2.28	
Often	66	15.03	9	2.05	
Almost always	79	18	7	1.59	
I trim fat from meat before cooking or eating?	n=220		n=219		
Almost never	57	12.98	1	.23	
Seldom	59	13.44	7	1.59	
About half the time	22	5.01	9	2.05	
Often	29	6.61	68	15.49	

Almost always	**53**	**12.07**	**134**	**30.52**	**<.0001**
I select a low-fat rather than high fat food?	n=220		n=219		
Almost never	58	13.18	1	.23	
Seldom	64	14.55	6	1.36	
About half the time	40	9.09	12	9.09	
Often	27	6.14	72	16.36	
Almost always	**31**	**7.05**	**129**	**29.32**	**<.0001**
I avoid adding fat to food?	n=220		n=220		
Almost never	56	12.73	0	0	
Seldom	63	14.32	5	1.14	
About half the time	29	6.59	19	4.32	
Often	31	7.05	63	14.32	
Almost always	**41**	**9.32**	**133**	**30.23**	**<.0001**
After classes I have good knowledge about diabetes?	n=219		n=220		
None or very little	97	22.1	0	0	
Some	82	18.68	7	1.59	
Moderate amount	**24**	**5.47**	**95**	**21.64**	**<.0001**
Good	11	2.51	79	18	
Excellent	5	1.14	119	8.88	
After classes I know the risk factors for diabetes?	n=219		n=220		
None or very little	86	19.59	1	.23	
Some	92	20.96	7	1.59	
Moderate amount	**22**	**5.01**	**94**	**21.41**	**<.0001**
Good	13	2.96	81	18.45	
Excellent	6	1.37	37	8.43	

* Significant differences only shown for the responses with the largest change.

Discussion

This needs assessment identifies large gaps in diabetes care and prevention Clark County, Nevada. The most significant finding is that there is only one program in the city successfully addressing diabetes prevention though evidenced based practice methods.

In 2008, Nevada had 217,467 (NDC 2008) persons diagnosed with diabetes and based on diabetes education centers, only 2,680 persons or 3.2% of persons with diabetes sought diabetes self-management education. Even more alarming and urgent is the rate of Hispanic persons with diabetes in Las Vegas that do not or cannot seek self-

management training. Approximately 725 persons of Hispanic descent obtained diabetes self-management training in the city; this accounts for 10.4% of the persons who sought out for diabetes self-management education. Despite alarmingly increasing incidence of diabetes and one of the fastest Hispanic growing markets in the country, Las Vegas, Nevada is not successfully addressing the growing of this problem.

The current program being implemented in Las Vegas, An Ounce of Prevention, has demonstrated success in decreasing high risk behaviors that are linked to increased diabetes risk. Other researchers have also shown diabetes prevention interventions and education programs are successful at preventing diabetes onset and diabetes complications with different populations (Fisher, Walker et al. 2002; Bazzano, Serdula et al. 2005; Kosaka, Noda et al. 2005; Otto 2008).

Conclusion

The presented data suggests that by updating, expanding and implementing evidenced based diabetes prevention education programs that target high risk populations we can reduce the burden of diabetes costs on local and state budgets. Overall, even persons with diagnosed diabetes do not receive the necessary education that is needed to prevent further comorbidities of the disease. Healthy People 2010 target for diabetes prevention was 2.5 new cases per 1,000 population per year, but that goal has not been met evidenced by the rising incidence and prevalence of diabetes. Incidence increased 90% from 4.8 per 1,000 in 1995--1997 to 9.1 in 2005--2007 (CDC 2008). In June 2008, the CDC released a press release stating, "The number of persons with diabetes increases to 24 million" (CDC 2008).

Expansion of effective diabetes prevention programs is necessary to make an impact on the community. Diabetes prevention education programs can be tailored and implemented by Cooperative Extension faculty and staff by building on existing relationships with community centers, churches and schools. Cooperative Extension is the ideal agency to address and help in closing the gaps in diabetes prevention in Las Vegas, Nevada by utilizing the variety of experts already working with high risk populations in this community.

It is necessary to address the current status of the economy to stress the need for diabetes prevention and diabetes education in the community. Since interviews were conducted, two of the newest diabetes education programs have closed their doors. Of even greater concern is the unemployment rate up to 10.1% in February for Nevada, much higher than the national unemployment rate of 8.5%. With the rise of unemployment, the number of uninsured individuals will also continue to rise. With more Nevadan's not having access to health care, especially for diabetes medications and supplies, the cost of care incurred by the state will also rise. It is necessary to provide the community with basic diabetes information, with a focus on prevention of the disease. By focusing on the reduction of risk factors through behavior change, even persons with diabetes can improve their health status and make changes to reduce the burden of the disease in their own lives.

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