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Introduction

Diabetes mellitus is a major public health concern that is becoming more prevalent every year. Understanding the disease is an important aspect of developing policies and healthcare plans in order to treat diabetes. My research examines the link between emergency room visits and level of confidence among patients diagnosed by a physician with diabetes, based on data and survey questions from the California Health Interview Survey (CHIS). My research is situated in regions of Los Angeles County that have high diabetes rates and determine the disparities in different races across the county. Through a literature review I will first go into background about diabetes care in the United States. Then the review will examine diabetic emergencies and emergency room frequencies for diabetic patients, concluding with analysis of the Affordable Care Act. My research methods will address healthcare gaps in treating diabetes among different racial groups. Diabetes is a multi-dimensional disease that is effected by race, location, education level and access to healthcare. Los Angeles has a high rate of diabetes in certain areas and my research will address why there is such a wide divide between SPA regions. Without addressing these diverse aspects of the disease, diabetes rates will continue to rise with no sign of slowing down.

Diabetes: Background and Context

Diabetes mellitus is a disease in which the body is not able to control the amount of glucose in the blood (“Diabetes Mellitus - National Library of Medicine”). This occurs when the body cannot make sufficient insulin or does not make it the way it should (“Diabetes Mellitus - National Library of Medicine”). “Deficient insulin action results from inadequate insulin

secretion and/or diminished tissue responses to insulin at one or more points in the complex pathways of hormone action” (American Diabetes Association, 2009). Diabetes is a serious illness that can have long term effects on the body. Some long-term complications of diabetes include retinopathy with potential loss of vision; nephropathy leading to renal failure; peripheral neuropathy with risk of foot ulcers, amputations, and Charcot joints; and autonomic neuropathy causing gastrointestinal, genitourinary, and cardiovascular symptoms and sexual dysfunction along with hypertension (American Diabetes Association, 2009). Diabetes is a common chronic illness that can lead to complications which affects a person’s quality of life. This is why it needs to be addressed as a public health issue.

The classification for diabetes was first introduced in a paper by the National Diabetes Data Group of the National Institute of Health (NIH) in 1979. This was very important in the research and treatment of diabetes because the classification of diabetes was standardized through this paper. The paper distinguishes the difference between type 1 and type 2 diabetes. The classification of type 1 is, “insulin-dependent diabetes mellitus, is usually characterized clinically by abrupt onset of symptoms, insulinopenia and dependence on injected insulin to sustain life, and proneness to ketosis” (National Diabetes Data Group, 1979). This paper also made a key distinction that type 1 is not to be called juvenile diabetes anymore because type 1 can occur in any age, even though it is most common in adolescents. Type 2 diabetes is classified as noninsulin-dependent diabetes mellitus (NIDDM) which, “frequently presents with minimal or no symptoms referable to the metabolic aberrations of diabetes...patients with NIDDM are not dependent on insulin for prevention of ketonuria and are not prone to ketosis. However, they may require insulin for correction of symptomatic, or persistent, fasting hyperglycemia”

(National Diabetes Data Group, 1979). Type 2 diabetes can also be treated with a change in diet because type 2 is often found in patients who include a lot of fat and sugar in their diet. Type 2 is more common if a patient is obese or has a family history of diabetes. (National Diabetes Data Group, 1979). This classification is an important contribution to the study of diabetes because it distinguished the different biological distinctions between the two types of diabetes. Researching these two types is important because it gives a better understanding of the disease and how to treat it. The type of diabetes I will mostly be focusing on in my research is type 2 diabetes because type 2 is more easily treated and prevented with health care interventions.

Literature Review

There have been many publications and studies on diabetes in the United States because it is a growing chronic disease. Although there are several successful treatments in diabetes care, not everyone has equal access to these options resulting in gaps of treatment. Race, education, access to healthcare, and many other factors play a role in diabetes treatment success. My goal in this literature review is to prove that there is a gap in the research among diabetes treatment confidence and emergency rates especially among people of color.

Diabetes Treatment

Although diabetes cannot be prevented for those who have a genetic predisposition towards the disease, there are several ways it can be prevented and treated. Diet, physical activity, and medicine are all ways that can help treat and prevent diabetes (NIDDK). Type 1 diabetes requires the patient to use insulin regularly with meals. An insulin pump is another good

option which delivers insulin throughout the day. For type 2 diabetes patients, several different types of medications are required to treat the disease, not often do they require insulin. However, diet and exercise can have a great effect in treating type 2 diabetes. (NIDDK). Healthy foods can be more expensive and are not available in every food mart which makes healthy eating a challenge for some individuals. Many families are not able to afford fresh fruits, vegetables, and other non-fattening options. This makes healthy eating a privilege that is often not accessible to people of color who are more likely to live in low-income neighborhoods and have significantly less income. A study describes, “U.S. black and Mexican households have 1 percent of the wealth of whites in Los Angeles—or one cent for every dollar of wealth held by the average white household in the metro area” (de La Cruz-Viesca et al., 2016). There is a significant gap in wealth among different races in Los Angeles which can lead to people not being able to afford healthy foods. Also more wealth leads to better education which can effect diabetes care. Balancing medications, injecting insulin, exercising and dieting regularly are hard on a patient especially if they do not have the resources to take care of their disease. The proper tools and information on how to take care of a patient’s diabetes is given through health care. Without access to a healthcare or education on their disease, patients are often left questioning how they should treat their illness.

Education and literacy are a huge part of treating diabetes. A study was conducted measuring diabetes patients literary skills and their knowledge of their diabetes treatment. Their methods were a “a cross-sectional survey of patients with hypertension and diabetes presenting to the general medicine clinics at 2 urban public hospitals. Literacy was measured by the Test of Functional Health Literacy in Adults. Knowledge of their illness was assessed in patients with

diabetes or hypertension using 21 hypertension and 10 diabetes questions based on key elements in educational materials used in our clinics” (Williams, 1998). The methods for this research was survey based but then they used quantitative methods to determine the correlation between a diabetes patient’s literacy and their knowledge of diabetes. Medical vocabulary can be very confusing and not easy to read which is why it is so vital to test whether the average patient can understand their own disease and medical care. The results were that, “A total of 94% of patients with diabetes and adequate functional health literacy knew the symptoms of hypoglycemia compared with 50% of those with inadequate literacy ($P<.001$)” (Williams, 1998). These results show the link between literacy level and success in diabetes treatment. The higher the patient’s literacy level, the more healthy and successful they are in treating their diabetes. This is a very important find in treating diabetes because it proves that education is a huge part in treatment. Diabetes often requires several medications, measuring glucose level, and eating healthy which is hard to do without education and strong literacy skills. The United States has a racist past resulting in minorities being more likely to have lower access to education than whites, which results in worse healthcare and ability of taking care of themselves. Unless this systematic issue is fixed, people of color are left at a disadvantage when it comes to chronic illness and access to healthcare. Especially when it comes to diabetes, literacy plays a huge role in treating the disease and living a healthy life.

Race and Diabetes

Diabetes prevalence has important racial drivers. Several studies have described the link between diabetes and people of color (Spanakis and Golden, 2013). In a community-based

epidemiological survey in Boston, Massachusetts, researchers examined the correlation between race, diabetes, and socioeconomic status. The study concluded that, “After adjusting for age and gender, Blacks and Hispanics have statistically significantly increased odds of having diabetes: Black (Odds Ratio 2.0 with 95% confidence interval 1.4–2.9) and Hispanic (2.4; 1.6–3.4) compared to Whites. If socioeconomic status (a combination of education and income) is added to the model, these odds are reduced for both Blacks (1.6; 1.1–2.2) and Hispanics (1.6; 1.1–2.3) (Link and McKinlay, 2009). Their results were statistically significant, concluding that race is a significant factor in determining who is more susceptible to developing diabetes. This survey supports an understanding of the connections between diabetes, race, and socioeconomic status in the Boston area. This study can also be applied to Los Angeles because it is as diverse as Boston if not more diverse. Boston and Los Angeles are also two of the biggest cities in the United States which accounts for a larger population to study. The Boston study proves that race is a large factor in determining diabetes rates.

Race is usually defined in one of two ways, as a social construct or biological. Critics argue that race does not determine a person’s predisposition to a chronic illness. The argument that race is a social construct explains, “Detailed work in human genetics which reveals that there is almost as much genetic variation within racial groups (Africans, Asians, Caucasians) as there is between them (Lewontin, Rose, Kamin 1984, Nei and Roychoudhury 1993)” (Andreasen, 2000). This study is explaining that there is hardly any genetic variation between races. Humans are 99.9% identical in DNA makeup making the argument that race is a social construct (Karter, 2003). The question is, does a person’s genetic makeup make them more susceptible to diseases? The counterargument responds with, “Proponents often fail to mention

that although individuals are genotypically almost identical, the 10th of a percent of the genome's 3 billion letters that are different translates into roughly 3 million sequence differences, with some conferring dramatically differing risk of disease (e.g., cystic fibrosis or sickle cell disease). Thus, it has been argued that failing to design studies to accommodate the contingencies for interactions between populations and genes, important population differences in genetic susceptibility, if they exist, would likely remain undetected" (Karter, 2003). There is a debate in the medical field on whether or not diabetes is genetically predisposed for some races. A person's genetic makeup and family history could be the reason why some racial groups are more likely to develop diabetes. However, there is also the argument that discrimination is the reason for their predisposition to diabetes. "The question is not whether race is biological and whether its use in genetic sciences necessarily leads to harm. Rather the question is; Can genetics researchers looking into an important medical condition afford to misrecognize the fundamentally social meaning of race in understanding patterns of disease and health" (Montoya, 2011). Montoya is a scientist studying diabetes in the Mexican population and is describing why race matters in understanding diseases. Social behaviors and past discriminations all matter when looking at race because it affects behavior and overall access to medical care. My research shows that discrimination is more likely the answer as to why diabetes is more common in some races over others.

Several theories have examined why people of color are more likely to develop diabetes compared to white people. One study concluded, "Data suggest that racial and/or ethnic minorities in the United States have less access to preventative care, treatment, and surgery, and as a result, they experience delayed diagnoses and more advanced disease at presentation"

(Golden, 2012). There has been a long history of discrimination in the United States which continues today, resulting in less access to healthcare for many people of color (Williams, 2006). This is detrimental because in some cases, diabetes can be prevented with more education on the importance of diet, exercise, and regular doctors visits. The issue is that not everyone has access to these resources, especially people of color. Due to the lack of access to primary care, non white people are more likely to visit the Emergency Room for diabetic complications because of the lack of education and healthcare.

Diabetes in California

Diabetes is a huge issue in California because it is growing in prevalence, making it hard for healthcare to keep up with the demand for treatment. The UCLA Center for Health Policy Research's Health Policy Report described that, "In California, more than 13 million adults (46 percent of all adults in the state) are estimated to have prediabetes or undiagnosed diabetes. An additional 2.5 million adults have diagnosed diabetes. Altogether, 15.5 million adults (55 percent of all California adults) have prediabetes or diabetes. Although rates of prediabetes increase with age, rates are also high among young adults, with one-third of those ages 18-39 having prediabetes" (Babey, 2016). The number of people who have diabetes is growing in California and treatment has to keep up. Young adult rates for diabetes are also increasing which is concerning because diabetes is increasing not just for adults. Diabetes costs the state of California billions of dollars in treatment for its citizens. "In California, the total cost of diabetes was estimated to be more than \$27 billion, with \$19 billion of that spent on direct medical care for diabetes and \$8 billion on the indirect costs associated with the disease" (Babey, 2016).

Treating diabetes in California is costing the state billions of dollars. Even though not everyone is on Medi-Cal, the government still pays for treatment for many people. Diabetes in California is a huge issue because the chronic illness is becoming more prevalent and resources already are not equipped to treat everyone who has diabetes. Healthcare is especially difficult to afford for low-income individuals, making Medi-Cal essential to the healthcare system. Everyone deserves to have healthcare so they can live healthy lives without worrying about the costs. Without the proper healthcare resources for diabetic patients, their confidence for treating their diabetes will lower which leads to increased emergency room visits due to diabetic complications.

Diabetes and the Emergency Room

Diabetic emergencies reported for 14.2 million of hospital visits in 2014. These emergencies vary from “hypoglycemia” to “hyperglycemic crisis”. (Center for Disease Control, 2014).

Hypoglycemia is generally defined as a blood glucose level < 60 mg/dl which is lower than a normal blood glucose level (McNaughton, 2011). Hyperglycemia is defined as a higher blood glucose level than normal which is a blood glucose level of >100 mg/dL (Mouri, 2017). Some cases of hypoglycemia and hyperglycemia are so serious that it can lead to amputation, damage to the eye, kidneys, nerves, heart, the peripheral vascular system, and death (Mouri, 2017). Most of the time hypoglycemia and hyperglycemia are preventable with proper control of diabetes.

One study concluded that, “Approximately 20% of [emergency] visits for diabetic patients were attributed to preventable complications of diabetes” (Murphy et al., 1985). The data around emergency room diabetes patients proves that with better control around diabetes, many emergency visits can be reduced. Preventable measures for diabetic complications include,

measuring insulin levels every day, regularly visiting a doctor, and healthy diet and exercise. However, these preventative care for diabetes are expensive and not everyone has access. One theory to why there are so many diabetic emergencies is, “diabetic patients without access to a primary care physician or who come from a lower socioeconomic background may have higher ED [emergency department] utilization for diabetes management” (Yan, 2017). This theory is supported in several studies and preventative measures can be used to treat diabetes before a diabetic emergency occurs. People who cannot afford healthcare and come from a lower income background struggle to find healthcare in general. Without proper medical treatment, their diabetes can worsen resulting in an emergency that may have been preventable if they had been seeing a regular doctor. In some cases, people may not know they even had diabetes until their condition worsens and it becomes a medical emergency. The issue is that not everyone has access to a primary care doctor or regular diabetic treatment. Patients’ diabetes can easily lead to complications if patients are not instructed how to properly take care of their illness.

The Correlation between Primary Care and the Emergency Room

Even though some Americans have healthcare, there is a barrier that exists between access to a primary care physician. This directly correlates to Emergency Room visits because a patient is more likely to visit the Emergency Room if they cannot receive care from primary care (Rust, 2008). A study published by the American Medical Association described that, “ even after adjusting for other socioeconomic and health-related factors: (1) “couldn’t get through on phone” (2) “couldn’t get appointment soon enough” (3) “waiting too long in doctor’s office” (4) “not open when you could go” and (5) “no transportation” (Rust, 2008). These various barriers

prevent patients from receiving primary care, resulting in more frequent Emergency Room visits. These barriers can also frustrate a patient so they will not try to get primary care help for their diabetes which results in their health worsening. The study also concluded that, “Interventions to improve effective access to medical care such as open access scheduling might have benefits not only for individual patients and practices but also for health policy related to cost-effective health care delivery systems and our need to relieve overcrowded conditions at EDs” (Rust, 2008). Often the ER is overwhelmed by demand for care, resulting in long wait times that could put patients at risk. Some of these emergencies could have been prevented if other sectors of the healthcare system were more easily accessible. The fact that many Americans have access to health insurance does not mean they will receive timely and adequate care. One solution to reducing Emergency Room visits is to improve accessibility to primary care for patients. Another study concluded that, “Among children without a regular source of care, the percentage of all health care received in the emergency room was much higher, suggesting that enrollment of children in sources of primary care is a critical component of reducing emergency room use for primary care, as well as facilitating the receipt of prevent” (Orr et al., 1991). There is a strong correlation between primary care treatment and emergency room care, suggesting that with improved primary care access, emergency room visits will decrease. Many studies suggest that emergency room visits can be prevented with proper healthcare intervention. Primary care is a basic human right and no child or adult should be deprived of this access. Primary care can also be used as a preventative tool so are less likely to develop diabetes if they have easier access to doctors.

Primary Care Under the Affordable Care Act

The Affordable Care Act (ACA) of 2010 greatly increased the number of people who have health insurance in the United States and the number of primary care that is needed increased also. The demand for primary care doctors rose because the number of patients increased. “Since primary care physicians typically serve as the point of entry into the healthcare delivery system, an adequate supply of them is critical to meeting the anticipated increase in demand for medical care resulting from expansion of coverage” (Hofer, 2011). Expanding healthcare coverage is great for the healthcare of Americans, however, the system has to be equipped in handling millions of people who will utilize primary care. Primary care is usually not equipped to handling this many people which results in many using the ER for immediate care instead of waiting to see a primary care doctor.

Diabetes and the Affordable Care Act

Since the Affordable Care Act (ACA) was signed into law in 2010, over 40 million people gained health insurance (Burge and Schade, 2014). The ACA made it so that insurance companies cannot withhold medical care for a person who has a pre-existing condition, which includes diabetes. It is estimated that “the cost of diabetes supplies to individuals is estimated to be between \$350 and \$900 per month, with the cost of an insulin pump adding another \$2,500 per year. Unfortunately, the ACA provides few details about whether or not these expenses will be covered and whether or not these expenses will be applied before or after deductibles are met” (Burge and Schade, 2014). Diabetes is an expensive disease to treat which makes it difficult to treat every patient under the ACA. The ACA has no language or strategy in which these costs

will be covered. The ACA was an important policy in delivering healthcare to many Americans who would have not had healthcare if it were not for this Act but there still needs to be improvements.

Diabetes was mentioned several times in the ACA. Section 399V-3 in the ACAs states,

“(a) IN GENERAL.—The Secretary, acting through the Director of the Centers for Disease Control and Prevention, shall establish a national diabetes prevention program (referred to in this section as the ‘program’) targeted at adults at high risk for diabetes in order to eliminate the preventable burden of diabetes. “(b) PROGRAM ACTIVITIES.—The program described in subsection (a) shall include— “(1) a grant program for community-based diabetes prevention program model sites; “(2) a program within the Centers for Disease Control and Prevention to determine eligibility of entities to deliver community-based diabetes prevention services; “(3) a training and outreach program for lifestyle intervention instructors; and “(4) evaluation, monitoring and technical assistance, and applied research carried out by the Centers for Disease Control and Prevention” (Affordable Care Act, 2010).

This section of the ACA describes preventative care for chronic diseases which includes diabetes. This measure was introduced to try to cut down costs of diabetes because diabetes is a great cost for Medicaid. Diabetes is mentioned only a few times in the ACA and when it is mentioned it only describes measures for preventative care, not about how to implement healthcare after a person has diabetes. Diabetes is an expensive disease to treat and the ACA should have a plan for treatment so that everyone is able to get the care they need. Diabetes is

increasing in the United States in general and something needs to be implemented or added to the ACA so the American people get adequate care.

Conclusion

There have been similar studies relating to diabetes care that I find useful and relevant to my research. I described a survey research project done in Boston, Massachusetts on the correlation between race and diabetes which was similar to my methods for my research. They conducted a survey and analyzed the results in a quantitative form. Although I am not conducting my own survey, I am using correlations to determine the relationship between two questions asked on a survey along with diabetes rates in Los Angeles county among different racial groups. Many researchers have determined that race and diabetes are linked due to the the high rates of diabetes among people of color. This fact cannot be ignored because better treatment and preventative care can be found if race is a factor of study. The goal is to better learn how to treat diabetic patients in Los Angeles County so they will not use the emergency room as frequently.

My research will fill the gap in diabetes care in Los Angeles and how emergency room utilization is related to confidence levels in controlling a patient's diabetes. There are several theories as to why the emergency room is used so frequently and many theories conclude that it is because of lack of primary and preventative care. My research will use quantitative data to see what the correlation between confidence level in controlling diabetes and the number of times that patient enters the ER for diabetic related symptoms. There are no studies on how a patient evaluates their own confidence in controlling their disease and the frequencies of emergency room visits. Los Angeles county has several geographic regions with high diabetes rates and my

research will explain why these certain areas have such high diabetes rates compared to others. Understanding the populations who are most at risk is essential to learning more about the disease. Diabetes is a complex disease and race, location, and education level are all factors in the disease.

Methods

Quantitative SPSS

This research includes a mixed-methods approach through quantitative and qualitative data. I used SPSS (Statistical Package for Social Sciences) to code the California Health Interview Survey (CHIS) data to answer my research questions. Overall, this project aimed to better understand patterns of certain areas of Los Angeles County that have high diabetes rates. A crosstab test was run to learn what the relationship and significance is between number of times a diabetic patient enters the ER and their confidence level in controlling their diabetes. A crosstabs test was used for testing the relationship between two categorical variables. A chi squared test is also used to test the strength of the relationship between these two categorical variables. These are both questions that were asked in the CHIS survey. I looked at the different variables and their relationship to one another and the analysis helped discern some new patterns. Confidence level was asked as, “How confident are you that you can control and manage your diabetes? Would you say you are...”

Very confident,1

Somewhat confident,	2
Not too confident, or.....	3
Not at all confident?	4
REFUSED	-7
DON'T KNOW	-8

Emergency room visit frequency was asked as, “During the past 12 months, have you had to visit an emergency room because of your diabetes?”

YES	1
NO.....	2
REFUSED	-7
DON'T KNOW	-8

SPSS was used with both the questions above to determine the strength of correlation between the two variables. The first step was filtered all of the answers that did not apply to the data set, which was everyone who answered “REFUSED” and “DON’T KNOW” for both variables. Then crosstabs and chi table were run in order to get the likelihood ratio (asymptotic significance) to determine the association between the two variables. Crosstabs can calculate whether a relationship between two variables is due to chance or is statistically significant. Chi square is an inferential statistic which is used make inferences from the sample to the population regarding the hypothesized relationship. Then by looking at the Phi and Cramer’s V value, indicates the strength of association in the chi squared test. Phi is a chi-square based measure of association which depends on the sample size and strength of relationship. Cramer's V is another chi-squared

measure of association and it gives good norming from 0 to 1 regardless of size. The coding was all conducted in SPSS.

Looking at the number of times a patient goes to the ER is an indicator of how well they have their illness under control (cite). One study concluded that, “Approximately 20% of [emergency] visits for diabetic patients were attributed to preventable complications of diabetes” (Murphy et al., 1985). The data about emergency room diabetes patients demonstrates that with better control around diabetes, many emergency visits can be reduced. I compared the diabetes rates in each region of Los Angeles by race/ethnicity in order to better understand the population of the highest diabetes rate regions using CHIS data and by using a pivot table in excel. For the qualitative part of my research, I interviewed people who worked with nonprofits in the Los Angeles area that have worked with diabetes patients and public health experts to determine why some people have higher rates of diabetes. These interviews were crucial in understanding how diabetes is affecting communities, especially low-income communities of color.

CHIS

Los Angeles County Department of Public Health divides the county into eight Service Planning Areas (SPAs) which are geographic regions within Los Angeles County. Each SPA is made up of several cities and allows the Department of Public Health to deliver care to those specific geographic regions. I compared the different SPA areas for Los Angeles to determine which SPA has the highest diabetes rates by running in a query on Ask CHIS (Ask CHIS). The next step was to break down the population of that SPA into different racial groups to determine

if there are any differences among diabetes rates. This determined if there are any vulnerable populations in diabetes among racial groups and geographic location.

According to CHIS, SPA 6 and SPA 8 have the highest percentage of people with diabetes. In SPA 6 which serves the communities of south Los Angeles, there is a 17.8% diabetes rate among adults,. In SPA 8, which serves serves the communities South Bay, there is a diabetes rate of 16.1%. The Los Angeles County SPA website accounts for slightly different numbers and states that SPA 2 and 7 have the highest diabetes rate. This may be due to the fact that they might have different data from another year, or their survey may be slightly different than CHIS. For my research I chose to use CHIS data because it is more current than the Los Angeles County website.

These methods answer my research question because they use quantitative survey data to better understand that diabetes rates are multidimensional and are dependent on several factors of the geographic location, race, and access to healthy foods (Golden, 2012). By using the data and correlation test from CHIS, I determined how diabetes emergency rates correlate to a patient's confidence in treating their diabetes. Emergency room rates tied to diabetic emergencies show a lack of primary care because many diabetic emergencies can be prevented through proper healthcare intervention. The issue is that primary care is not accessible to everyone especially people of color (Link and McKinlay, 2009). A patient also has to have adequate education and literacy in order for them to have confidence in treating their disease. Comparing diabetes rates among the different SPA regions of Los Angeles will help determine which populations are most

at risk for the disease. Los Angeles is a diverse county that needs to develop a plan to better treat the healthcare disparities that exist among communities with high diabetes rates.

Variables

The variable of how confident an individual is at controlling and managing their diabetes is important because it shows how people perceive their treatment around their diabetes. It relates to health literacy because if a person is literate and understanding of their illness, they are more confident which is a good measurement of the quality of care they are receiving. (Ishikawa and Yano) The more health care they receive the more confident they are likely to have. UCLA does not describe their variable, only how they asked if a person believes they are confident in managing their diabetes. They do not describe in their methods what this variable means so I had to do some additional research which demonstrates that health literacy and level of healthcare are related to health confidence (Ishikawa and Yano). A doctor described it best when writing about health confidence, “Health confidence is an effective proxy for engagement, and practices can easily measure it using a single question: ‘How confident are you that you can control and manage most of your health problems?’ The question initiates self-reflection and meaningful communication between patients and health care providers...For both hospital and ambulatory care patients, health confidence is most positively associated with the quality of information provided to the patient and access to care. Low health confidence is strongly associated with low financial status and a high burden of illness” (Wasson, 2014). Health confidence is an important component when treating patients because it is a good indicator of how well they have been given treatment and how well they understand their illness. Diabetes is a very complex disease

which requires a lot of everyday monitoring, that is why confidence is so important to treating this disease. Mismanagement of diabetes can lead to Emergency Room visits and is correlated to confidence because understanding the disease could have been prevented some diabetic emergencies.

Interviews

The last piece of my project was to conduct interviews with various professionals in the medical, county, and nonprofit health sector. My interviews were conducted over the phone and I took notes on piece of paper as the interview was going. The interviews received approval from the Institutional review board (IRB) of Occidental College. The research project had to be described in the IRB application along with a description of the interview process. This ensured that the interviewees would be protected. The project was approved on November 19, 2018 and the approval number is Moor-F18111. The interviewees' suggestions were valuable in evaluating the availability level of healthcare for diabetic patients and why diabetes is so prevalent in Los Angeles.

Interviews were conducted with 4 professionals including a Kaiser Permanente doctor, a Los Angeles County public health worker, and two women who have worked for nonprofits in Los Angeles, their advice on how to treat diabetes in Los Angeles. The first interview was with a Kaiser Permanente doctor named John P. Martin who is the Co-Director, Diabetes Complete Care Program and National Diabetes Guideline Lead. He was asked him a series of questions about what he does at Kaiser, why he believes diabetes is so prevalent among different races, and

other questions regarding diabetes care management. He was very knowledgeable and provided some good explanations for why diabetes is such a multidimensional disease.

Next, Doctor Eloisa Gonzalez who works for Los Angeles County Department of Public Health who is in the Division of Chronic Disease and Injury Prevention was interviewed. She was asked her several questions about how Los Angeles County is working to implement policy to help the high diabetes prevalence in Los Angeles. As a county employee she provided a sense of how the government is helping these diabetic individuals.

The final two interviews were with Veronica Ponce de Leon and Sandy Navarro who both have worked with nonprofits who have diabetes management programs. They have worked with diabetic patients on a community level, making their voices critical to understanding community level issues. Questions included how communities are working to fill in the gaps of diabetic care.

Data

The data below is arranged in charts and tables about diabetes in Los Angeles. Diabetes affects every race and location in Los Angeles but at different rates.

	National	LA County	Antelope Valley	San Fernando	San Gabriel	Metro	West	South	East	South Bay
			SPA 1	SPA 2	SPA 3	SPA 4	SPA 5	SPA 6	SPA 7	SPA 8
Gender										
• Percent of population who are male ¹	49.2 ^c	49.3	49.7	49.5	48.9	51.3	48.5	48.8	49.2	48.9
• Percent of population who are female ¹	50.8 ^b	50.7	50.3	50.5	51.1	48.7	51.5	51.2	50.8	51.1
Age Group										
• Percent of population ages 0-5 years ¹	7.5 ^c	7.5	8.4	7.0	6.8	7.1	6.0	9.7	8.2	7.6
• Percent of population ages 6-17 years ¹	15.6 ^b	15.4	18.5	14.9	15.0	12.7	10.4	19.1	17.3	15.6
• Percent of population ages 18-39 years ¹	29.8 ^b	32.5	32.1	31.1	30.9	35.6	34.7	35.3	32.7	30.9
• Percent of population ages 40-64 years ¹	32.7 ^b	32.2	31.1	34.0	33.1	32.7	33.4	27.5	30.2	33.0
• Percent of population ages 65 years or older ¹	14.5 ^c	12.4	9.9	12.9	14.3	11.8	15.5	8.4	11.6	12.8
Race										
• Percent of population who are Latino ¹	17.8 ^c	48.4	44.8	40.2	46.3	51.8	16.0	68.2	73.5	40.4
• Percent of population who are white ¹	63.5 ^c	28.3	34.6	44.6	21.2	24.8	64.0	2.4	14.0	28.4
• Percent of population who are African American ¹	12.6 ^c	8.5	16.2	3.5	3.7	5.2	5.7	27.4	3.0	14.8
• Percent of population who are Asian ¹	5.3 ^c	14.4	3.8	11.5	28.6	17.9	14.0	1.7	9.0	15.4
• Percent of population who are Native Hawaiian or Other Pacific Islander (NHOP) ¹	0.2 ^c	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.9
• Percent of population who are American Indian/Alaskan Native ¹	0.7 ^c	0.2	0.4	0.2	0.2	0.2	0.2	0.1	0.2	0.2

Figure 1. Demographics of SPA regions in Los Angeles. Source: Los Angeles County Department of Public Health *Key Indicators of Health 2017*.

Latinos make up the highest percent of all SPA regions except in West LA which is predominately white.

African American	Latinx	White
7.7%	6.3%	5.3%

Table 1. Percentage of people ever diagnosed with diabetes by race in Los Angeles County.

According to Table 1, African Americans have the highest percentage of diabetes diagnoses in Los Angeles county. The highest prevalence by SPA of African Americans diagnosed with diabetes is 13.6% in Antelope Valley, Latinx 8.3% in San Gabriel and South LA, and for whites 8.3% in East Area. This data shows that African Americans are more likely to get diabetes in Los Angeles county even though they are less genetically susceptible to diabetes than Latinx and White people.

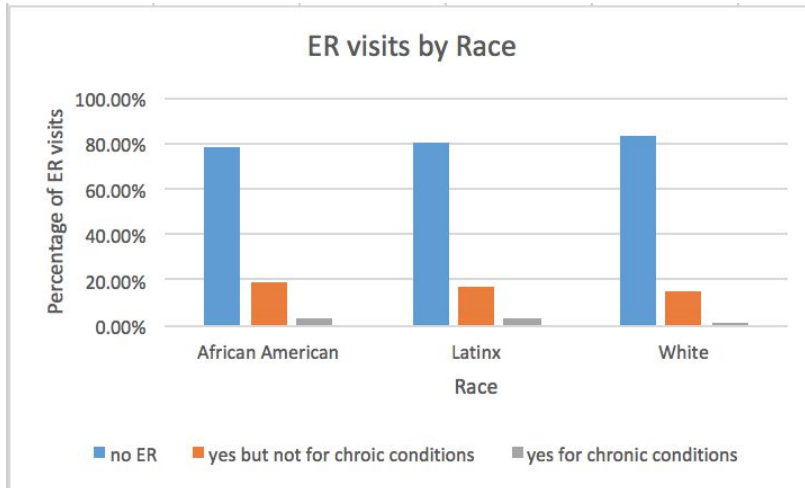


Figure 2. Emergency Room visits for chronic disease (asthma, heart disease, and diabetes) by race in Los Angeles County in 2009. (CHIS)

As shown in Figure 2, African Americans are also more likely to visit the ER for chronic diseases than Latinx and White people.

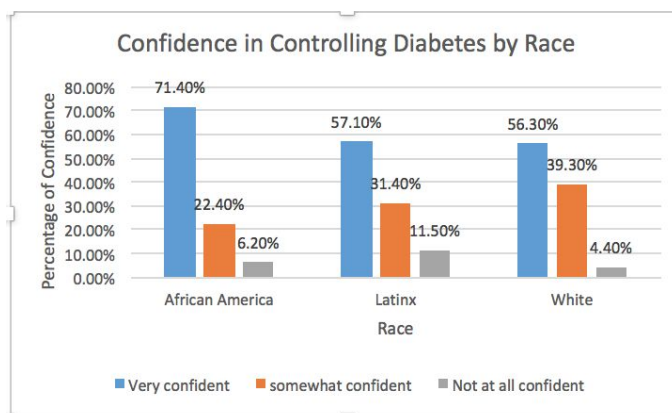


Figure 3. Confidence in Controlling Diabetes by race in Los Angeles County in 2017. (CHIS)

The interesting statistic shown in Figure 3 is that African Americans recorded feeling more confident in treating their diabetes than Latinx and White people. This could be because Latinx people may not feel as confident reading English over Spanish, especially older adults (Krogstad et. al. , 2015). Confidence to controlling diabetes is an important variable to use because it is related to health literacy which is a huge part of diabetes treatment.

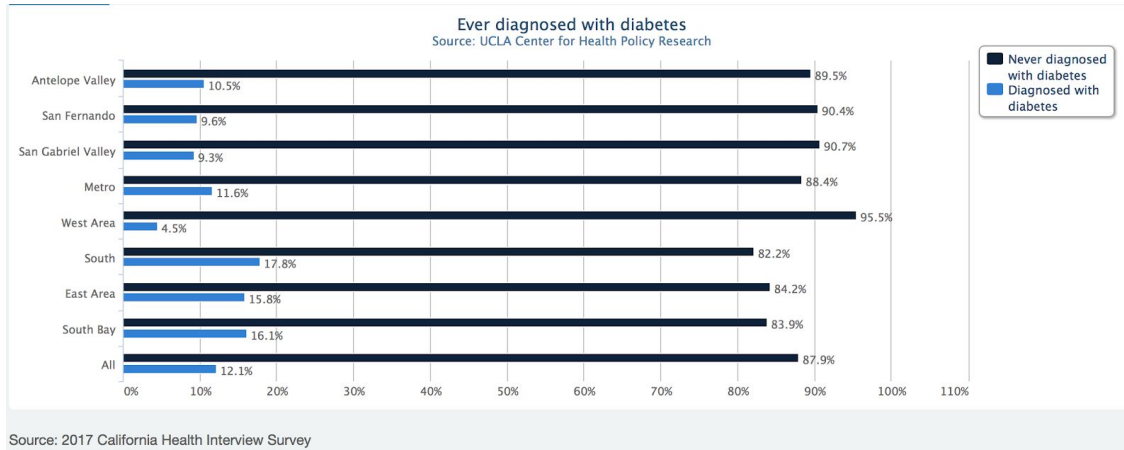


Figure 4. The percentage of people diagnosed with diabetes by Los Angeles county SPAs in 2017. (CHIS)

Figure 4 depicts that the highest rate of diabetes among SPA regions is South LA with 17.8% prevalence. It is important to note that South LA is predominately people of color. This is a high percentage compared to the rest of Los Angeles County which shows that this region is highly susceptible to diabetes.

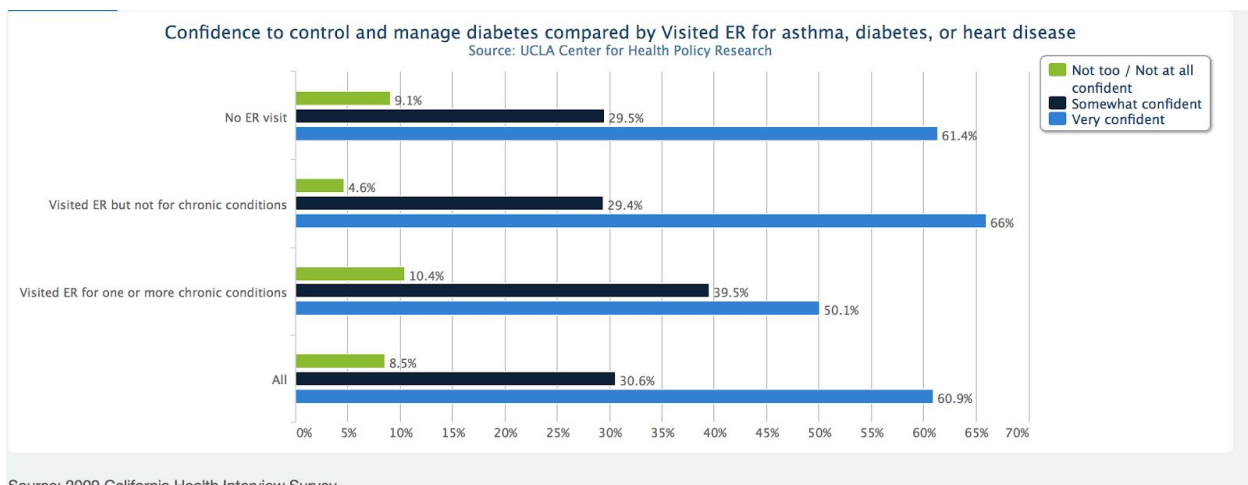


Figure 5. Confidence intervals between confidence to control and manage diabetes compared by visited ER for asthma, diabetes, or heart disease among all races in Los Angeles County in 2009. (CHIS)

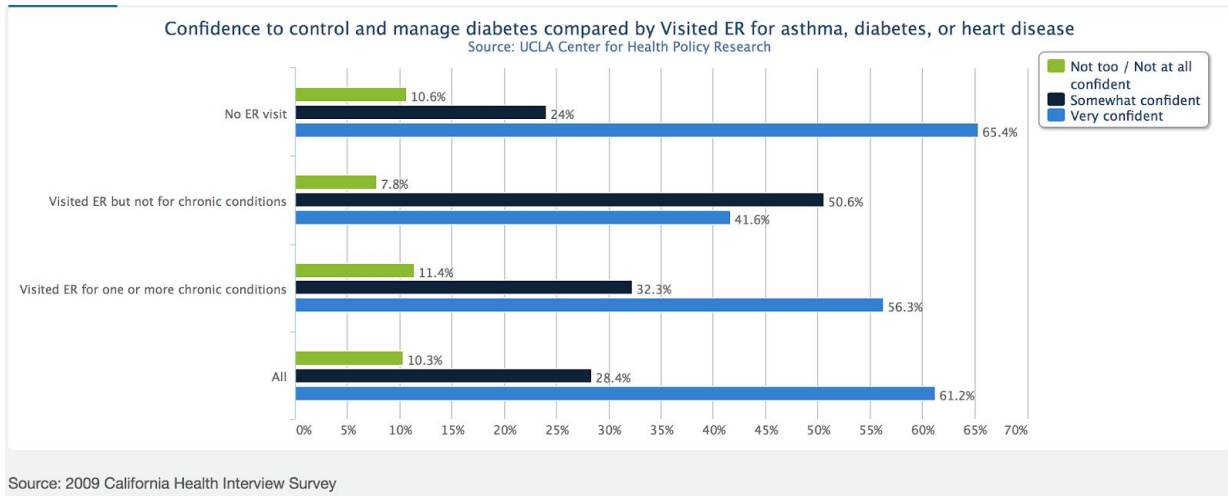


Figure 6. Confidence intervals between confidence to control and manage diabetes compared by visited ER for asthma, diabetes, or heart disease among Latinx in Los Angeles County in 2009. (CHIS).

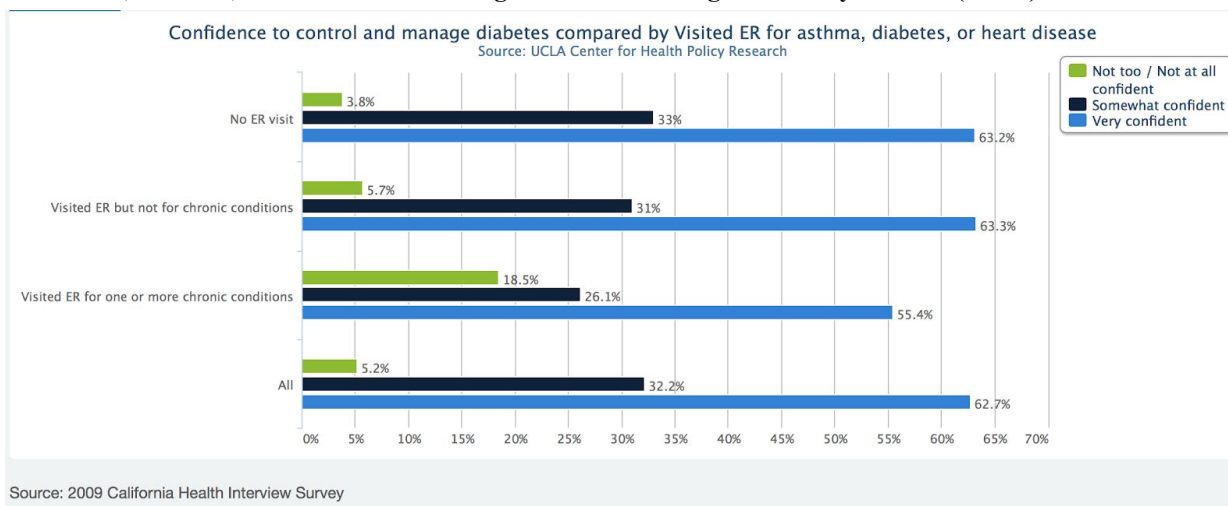


Figure 7. Confidence intervals between confidence to control and manage diabetes compared by visited ER for asthma, diabetes, or heart disease among white people in Los Angeles County in 2009. (CHIS)

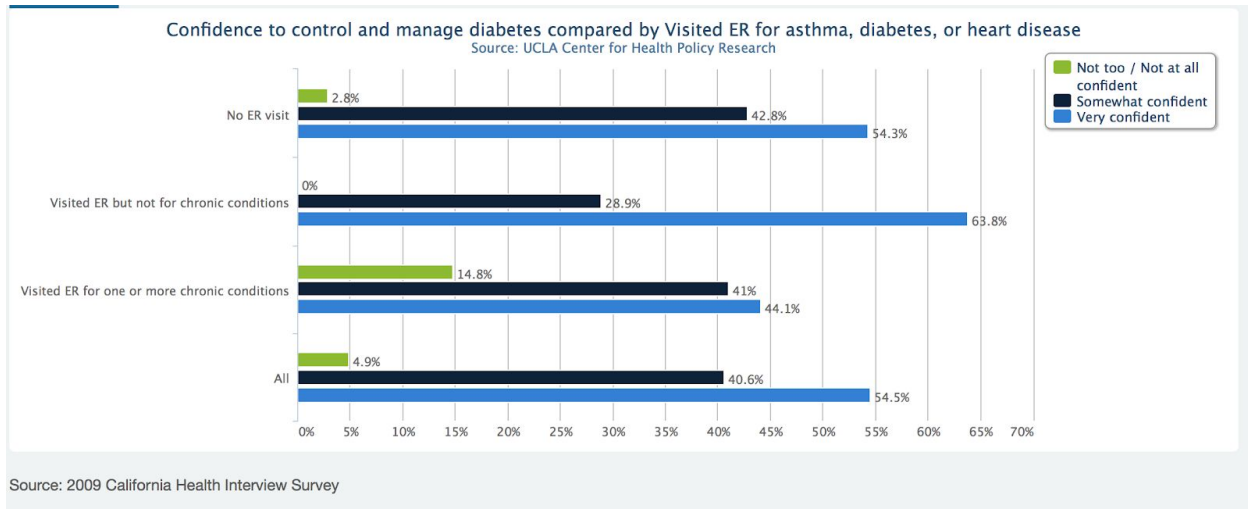


Figure 8. Confidence intervals between confidence to control and manage diabetes compared by visited ER for asthma, diabetes, or heart disease among African Americans in Los Angeles County in 2009. (CHIS)

Figures 5-8 describe the variables confidence to control and manage diabetes compared by visited ER for asthma, diabetes, or heart disease. Among all races, there is a high percentage of 10.4% of people who are not confident in controlling their diabetes and visited the ER for one or more chronic conditions which is shown in Figure 5. This figure depicts that as confidence level decreases, the ER visits increase among all races. Even though it is a low percent change, there is still a correlation. This is a steady trend among all races, where there is a correlation between confidence level for treating diabetes and visits to the ER (Figures 6-8).

CONFIDENCE TO CONTROL AND MANAGE DIABETE * VISITED ER FOR DIABETES IN PAST 12 MOS Crosstabulation					
		VISITED ER FOR DIABETES IN PAST 12 MOS		Total	
		YES	NO		
CONFIDENCE TO CONTROL AND MANAGE DIABETE	VERY CONFIDENT		98	2773	2871
			137.9	2733.1	2871.0
			3.4%	96.6%	100.0%
			42.8%	61.1%	60.2%
			2.1%	58.2%	60.2%
	SOMEWHAT CONFIDENT		82	1445	1527
			73.4	1453.6	1527.0
			5.4%	94.6%	100.0%
			35.8%	31.8%	32.0%
			1.7%	30.3%	32.0%
	NOT TOO CONFIDENT		35	254	289
			13.9	275.1	289.0
			12.1%	87.9%	100.0%
			15.3%	5.6%	6.1%
			0.7%	5.3%	6.1%
NOT AT ALL CONFIDENT		9	65	74	
		3.6	70.4	74.0	
		12.2%	87.8%	100.0%	
		3.9%	1.4%	1.6%	
		0.2%	1.4%	1.6%	
Total		229	4537	4766	
		229.0	4537.0	4766.0	
		4.8%	95.2%	100.0%	
		100.0%	100.0%	100.0%	
		4.8%	95.2%	100.0%	

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	154.761 ^a	4	.000	.000		
Likelihood Ratio	75.255	4	.000	.000		
Fisher's Exact Test	76.390			.000		
Linear-by-Linear Association	26.929 ^b	1	.000	.000	.000	.000
N of Valid Cases	4766					

- a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is .24.
- b. The standardized statistic is -5.189.

Symmetric Measures

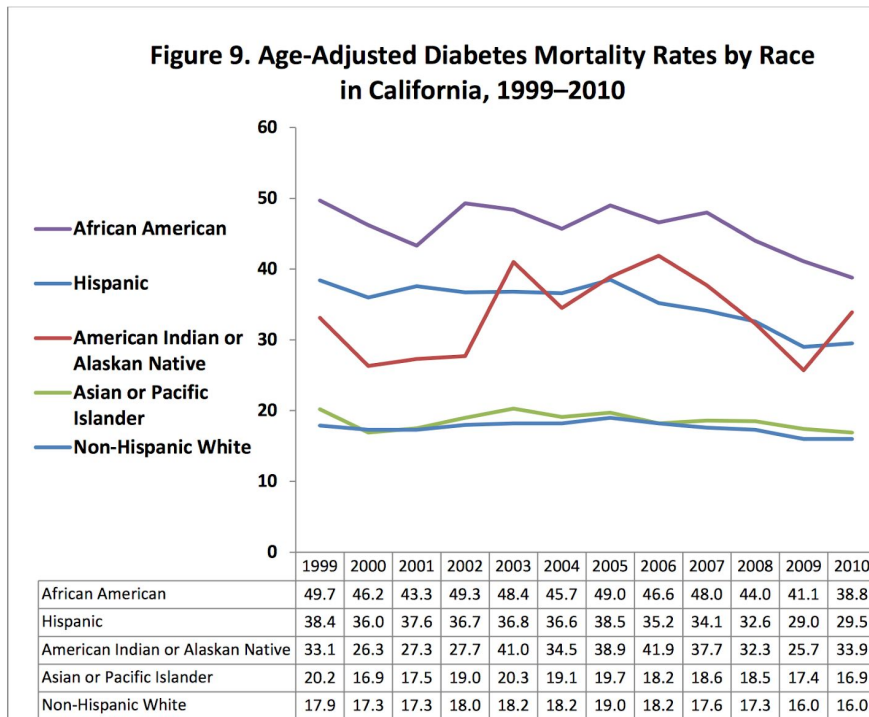
	Value	Asymptotic Standard Error ^a	Approximate T ^b	Approximate Significance	Exact Significance
Nominal by Nominal Phi	.180			.000	.000
	Cramer's V	.180		.000	.000
Ordinal by Ordinal Kendall's tau-b	-.076	.016	-4.624	.000	.000
N of Valid Cases	4766				

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.

Figure 9. Crosstabs and Chi-Square Tests in order to establish significance and association for confidence to control and manage diabetes and visited ER for diabetes in the past 12 months in 2009.

There is a positive weak correlation between emergency room visits and confidence in treating diabetes as shown in Figure 9. By running a crosstab and chi table of both variables, the likelihood ratio (asymptotic significance 2-sided)=0.000 which is smaller than 0.05 so there is an

association. However, the Phi and Cramer’s v shows the strength of association which is 0.18 showing that the association is positive but weak. Even though there is a weak correlation, the SPSS data shows that there is a correlation.



Source: CDC WONDER Online Database released 2012.

Figure 10. Age-Adjusted Diabetes Mortality Rates by Race in California, 1999-2010. Source: California Department of Public Health Chronic Disease Control Branch.

Figure 10 depicts that non-hispanic whites are the least likely race to die from diabetes. African Americans are almost twice as likely to die from diabetes than non-hispanic whites.

Count of RACEHPR2		Column Labels		
Row Labels		no	yes	Grand Total
not at all confident		1.43%	4.02%	1.55%
African American		0.07%	1.34%	0.13%
African Indian/Alaskan Native		0.02%	0.00%	0.02%
Asian		0.20%	0.00%	0.19%
Latino		0.37%	1.79%	0.44%
Other single/multiple race		0.20%	0.00%	0.19%
White		0.57%	0.89%	0.59%
not too confident		5.60%	15.63%	6.07%
African American		0.33%	1.79%	0.40%
African Indian/Alaskan Native		0.13%	0.00%	0.13%
Asian		0.97%	0.45%	0.95%
Latino		1.34%	4.02%	1.47%
Other single/multiple race		0.44%	2.68%	0.55%
White		2.38%	6.70%	2.58%
somewhat confident		31.85%	36.61%	32.07%
African American		2.34%	3.13%	2.37%
African Indian/Alaskan Native		0.60%	0.00%	0.57%
Asian		4.32%	3.57%	4.28%
Latino		4.89%	7.59%	5.02%
Other single/multiple race		1.87%	3.57%	1.95%
Pacific Islander		0.04%	0.00%	0.04%
White		17.79%	18.75%	17.83%
very confident		61.12%	43.75%	60.30%
African American		3.75%	4.91%	3.80%
African Indian/Alaskan Native		1.43%	0.45%	1.39%
Asian		4.50%	2.68%	4.41%
Latino		8.71%	7.59%	8.65%
Other single/multiple race		3.72%	5.80%	3.82%
Pacific Islander		0.13%	0.00%	0.13%
White		38.88%	22.32%	38.10%
(blank)		0.00%	0.00%	0.00%
(blank)		0.00%	0.00%	0.00%
Grand Total		100.00%	100.00%	100.00%

Figure 11. Pivot Table of Confidence level to control and manage diabetes treatment by race and whether or not they visited the Emergency Room for diabetes in 2009. (CHIS)

Count of ER visits for diabetes		Column Labels		
Row Labels		no	yes	Grand Total
African American		6.48%	11.16%	6.70%
African Indian/Alaskan Native		2.18%	0.45%	2.10%
Asian		9.98%	6.70%	9.83%
Latino		15.32%	20.98%	15.58%
Other single/multiple race		6.24%	12.05%	6.51%
Pacific Islander		0.18%	0.00%	0.17%
White		59.62%	48.66%	59.11%
Grand Total		100.00%	100.00%	100.00%

Figure 12. Pivot Table of Visits to the Emergency Room by Race in 2009. (CHIS)

In Figure 12, a pivot table shows percentage breakdowns of emergency room visits and confidence in treating diabetes. Some interesting findings were that of the African Americans that went to the ER, 4.91% recorded being very confident and 3.75% who were very confident recorded not going to ER. This shows that even though African Americans recorded having confidence treating their diabetes, they still went to the ER for chronic conditions. This is unusual because white people and Latinx who recorded being very confident in treating their diabetes, were less likely to go to the ER for their chronic diseases. Also, the reason why the pivot table shows that as confidence grows, there is more frequent ER visits is because a lot more people recorded feeling confident in treating their diabetes which skewed the frequency. Another limitation of the pivot table is that a higher percentage of white people took the survey so their percentages tend to be higher. The data trend that is most important to highlight from Figure 11 is that among all races, as confidence increases a lesser percentage of people reported going to the emergency room over the percentage of people going to the emergency room.

Analysis

Confidence and Race

The data that was collected shows a narrative of lack of confidence among people of color in Los Angeles. This is important because the literature describes how confidence is important when treating illnesses, especially those that are as complex as diabetes. Figure 10 shows that even if African Americans answered that they are very confident in treating their diabetes, they are still more likely to go to the ER for chronic illnesses. Compared to white

people, the opposite is more likely to happen and if they answered that they are very confident, they are less likely to go to the ER. Collecting data on a patient's confidence is important when trying to treat their illness because understanding how to treat their illness is essential to keeping them out of the ER. There is not a huge difference in Emergency Room visits among people of color and white people but even a slight percentage difference is important to note (Figure 2). However, race and socioeconomic status is another important factor in treating diabetes because people of color are more likely to develop diabetes along with have less access to healthcare which is why they have such high rates of diabetes.

Socioeconomic Status and Diabetes

Socioeconomic status is another critical indicator when accounting for diabetes rates. A health researcher described, "The increase in the overall diabetes rate is concentrated in low-income populations and has risen from 9.0 percent in 1997 to 14.7 percent in 2007 for adults below the federal poverty level. In contrast, the diabetes rate has only increased from 5.3 percent to 7.1 percent during the same period for adults with incomes at or above 200 percent of the poverty level" (Huckfeldt, 2012). When treating diabetes in Los Angeles it is important to take into account a patient's socioeconomic status. There is a clear rise of diabetes among people living under the poverty level. When a person is living under the poverty level, it is hard to focus on health along with find access to a healthcare facility. There is a trend in healthcare where if a person has insurance and is living above the poverty level, they are less likely to develop diabetes.

Race in Los Angeles

According to the United States' Census Bureau in 2010, Los Angeles County is 70.9% White, 9.0% African American, and 48.6% Latinx/Hispanic (U.S Census Bureau). The census data shows that even though there are significantly more white people in Los Angeles, they are less likely to get diabetes. A few of the professionals I interviewed helped answer this question of why African Americans might be more confident than Latinx (shown in Figure 3). Dr. Martin described how health literacy is so important in treating diabetes. Since a proportion of Latinx are more likely to speak and understand Spanish over English compared to other races, they are less likely to feel confident in treating their diabetes because they might not understand their disease fully. Although there are healthcare professionals that are fluent in Spanish, there is still a gap in literacy due to the fact that they may not be able to understand once they leave the doctor's the instructions they were given to treat their chronic illness.

Confidence and Emergency Room Visits

There is a positive weak correlation between emergency room visits and confidence in treating diabetes as shown in Figure 9. By running a crosstab and chi table of both variables, the likelihood ratio (asymptotic significance 2-sided)=0.000 which is smaller than 0.05 so there is an association. However, the Phi and Cramer's v shows the strength of association which is 0.18 showing that the association is positive but weak. Even though there is a weak correlation, the SPSS data shows that there is a correlation. Diabetes is such a multidimensional disease that there are multiple reasons as to why emergency room visits for diabetes is frequent. Confidence

is just one factor that can affect success with treatment. My interviews with healthcare and county professionals shed some light on to why that is.

Communities in Los Angeles and Diabetes

In my interviews they all discussed that diet, socioeconomic level, and race all affect diabetic success outcomes which affects the frequency of emergency room visits. Dr. Martin described how many of the diabetic patients are Latinx and that they are genetically more likely to develop diabetes. However, what is interesting is that second generation Mexicans are more likely to develop diabetes because they have a more American diet as compared to first generation Mexicans who eat a more traditional Mexican diet. Traditional Mexican food is much healthier than American food. Another barrier for Mexican diabetic patients is the language barrier that can affect their healthcare and how they can interpret their care. Dr. Martin described how health literacy is a key element in diabetes management along with mental healthcare. He mentioned how 25% of diabetes management has to be mental healthcare so that the patient is equipped to take care of themselves. The emotional component of healthcare is one fourth of the battle when it comes to diabetes. All of these factors play a role in diabetes treatment and success in diabetic patients staying out of the emergency room.

Los Angeles County Work and Nonprofits

Los Angeles County is working on creating policies to help these diabetic patients which Doctor Eloisa Gonzalez from the Los Angeles County Department of Public Health described. Dr. Gonzalez discussed with me that LA County works to treat diabetes in multiple ways. Access to green space is important to create in communities because more people can have access to a

park to exercise in. Exercise can definitely help with preventing and treating diabetes. They also work with the National Prevention Diabetes Risk Program. This is not directly a county program but they sponsor individuals to go to this 8 week programs which provides education, practical hands on skills to treat diabetes, and classes on diet and exercise. The County holds education programs on top of the NPDRP.

Nonprofits often fill in the gaps in healthcare that doctors offices and the county cannot fill. Many people do not have healthcare nor have access. Nonprofits are a vital resource for many diabetic patients as Veronica Ponce de Leon and Sandy Navarro explained to me. Veronica Ponce de Leon worked for Esperanza Community Housing who has a healthcare programs including a Community Health Promoters Training Program. This program trains community members to provide education and patient advocacy. These promoters are usually bilingual in Spanish and English so they can reach a larger population. They are essential to the community because they build trust with individuals so they are more effective in providing information on various healthcare interventions including diabetes management. Veronica also worked for Meet Every Need with Dignity (MEND), where she led diabetic management classes. These classes were also essential to the community because she taught diabetic patients how to effectively read food labels, exercise, and manage doctor's appointments. Sandy Navarro also gave helpful information as to why diet is so important in treating diabetes. She also worked for Esperanza Community Housing where she learned how important community gardens were for providing fresh fruits and vegetables to a community where they do not have large access to a grocery store. Sandy Navarro described how food deserts are a huge problem in low income communities which contributes to the large diabetes prevalence in these areas. These interviews were essential

to my research because they information based on community experiences on what was effective in treating diabetes. Nonprofits

South Los Angeles- A Case Study

A report on South LA describes how South LA is severely underserved because a large percentage of people are under the poverty line. An average of 31% of people are under the poverty line, compared to the rest of California which is at 13.3% (United States Census Bureau). This number is more than twice the average for Los Angeles which shows the lack of resources and income in South LA. A report on South LA describes, “Many of South LA’s hospital-based programs focusing on heart disease, diabetes and cancer have dwindled. South LA community clinics struggle to subsidize education programs through a patchwork of grants and patient reimbursement from other services. The use of *promotoras* or community health workers serves as an alternative or complement to the traditional medical system of clinic and hospitals, yet credentialing and recognition by the mainstream health systems limit sustainability and expansion” (Park 49). There is a clear disparity in healthcare access in South Los Angeles which is why the area has such high rates of diabetes. There are a lack of healthcare programs and preventative programs in South LA compared to the rest of the other SPA areas. Another article described the effects the lack of access to healthy foods, “More than 30 percent of kids in some neighborhoods in south and east LA are obese compared to less than 12 percent on the west side. Less than 10 percent of adults in south LA are eating the recommended servings of fruits and vegetables every day. There’s less than half the park space there is on the west side. The diabetes mortality rate on the west side is 14 or 15 per 100,000 and in south LA it’s 43” (Waters, 2013).

South LA is clearly underserved with high rates of obesity and diabetes which are a result of lack of access to healthy foods. South Los Angeles is an area with high percentage of people of color with 24% black and 74% hispanic (United States Census Bureau). South LA has the highest percentage of diabetes patients in the county which is a great public health concern. The wealthier areas such as West LA have a higher average income level and better healthcare access which is why they have a much lower percentage of diabetes. The disparities between areas in LA are concerning because there is clear lack of healthcare which contributes to the rising diabetes rates. Diabetes is a complex disease which requires personalized and diverse sets of treatments which can affect a role in a patient's individual confidence in treating their diabetes. Without a patient's confidence in treating their diabetes and a lack of healthcare, the patient may experience serious side effects when their diabetes is not treated properly.

In the beginning of this project, I originally believed that confidence in treating diabetes would play a larger role in determining if a person ended up in the ER but I soon realized from my data that that was only a small piece of the equation. Personal confidence as it relates controlling and managing a person's diabetes relates to literacy rates and how well they have access to healthcare information. In the literature, it is clear that the frequency of Emergency Room visits among diabetic patients are driven by a lack of primary care (Yan, 2017). Primary care gives an essential tool in confidence and information on diabetes care management. Diabetes patients have the right to information and understanding their diabetes. Emergency Room visits are meant to be a last resort and can be prevented with more primary care visits. There is a gap in healthcare because these primary care visits are not being even distributed. South LA is a good example of how lack of healthcare access can lead to high diabetes rates. My

data depicts the pattern between people of color are underserved when it comes to diabetes and they are less confident in treating their diabetes. They also lack access to healthy foods which is why they have some of the highest percentages to diabetes and obesity.

Discussion

Diabetes is an extremely difficult chronic illness to treat because the treatment is so complex and is specific to the individual. Race is the biggest factor in the treatment of diabetes because of the cultural differences, racial biases in the medical field, and slight genetic differences. African Americans and Latinx have higher diabetes rates than white people in Los Angeles because of the previous factors that were in the analysis section. African Americans also are almost twice as likely as white people to die from diabetes. If there was a fair healthcare system that was highly accessible to all races, there would not be such a large gap of mortality rates among races. Health insurance and literacy are required to find an individualistic diabetes treatment that works for the patient. This includes, frequent visits to a primary care doctor, health literacy classes, mental health treatment, diet and exercise classes, and access to health foods. This is extremely hard for most patients to complete all of these steps especially if they do not have the resources or income in order to get these programs. Societal racism plays a part in this access because people of color are more likely to live in below the poverty line (Kaiser Family Foundation, 2017) and not have access to as many resources as white people. Racial differences to access to healthcare is essential in overcoming the challenges in diabetes treatment.

My data shows that even though a patient may feel confident in their own treatment and ability to treat their diabetes, it may not be enough to keep them out of the Emergency Room.

The ER is often used because of complications in the diabetes treatment and a lack of understanding the full diabetes treatment plan. The ER is supposed to be used as a last resort to treat a patient but often it is used as a primary resource for people who do not have access to other healthcare resources. There is definitely correlation between ER visits for chronic diseases and confidence in treating diabetes, the strength of that correlation is not strong but it does contribute to the understanding of why diabetes is such a complex chronic disease to treat. Confidence in treating and managing diabetes is an important question to ask a patient who is struggling with diabetes. Confidence is a good indicator of how well the health system is doing at treating their diabetes patients.

Limitations

CHIS is one of the leading health data sites for Los Angeles, however, there are some limitations to using their data. One limitation that is that they have a disproportionately high percentage of white respondents in their data survey. This skewed the data a bit when it came to the frequency of respondents. In Figures 9-10 you can clearly see this limitation but the trends in the individual races are still clear. The downside is that the frequency cannot be used.

Recommendations

There are several relevant recommendations that can be implemented in Los Angeles to address the high diabetes rates and improve the quality of healthcare among diabetes patients. The first recommendation is to require that doctors with diabetes patients ask how confident a patient is in managing and understanding their disease and disease treatment. By evaluating

confidence level, they are more likely to prevent ER visits and other complications because the patient better understands their disease. A doctor can ensure that a patient better understands their disease by asking if everything is clear and their treatment is in terms that they understand. Another policy recommendation is that more hospitals and doctors offices are available to SPAs with high diabetes rates, especially South Los Angeles. Los Angeles needs to incentivize healthcare groups and programs that reach in need communities so they receive better healthcare. This will also help the diabetes rates among people of color since a large percentage of people of color live in these SPAs with high diabetes percentages.

A case study that was shown to work to improve diabetes care was the Arkansas Diabetes Prevention Program with their *Diabetes Self-Management Education and Support (DSMES)* program. The CDC website featured this program and highly described their success, “Diabetes Self Management Education and Support provides evidence-based education to teach patients the knowledge and skills they need to manage their diabetes. DSMES may reduce health care costs associated with hospital admissions, readmissions, and complications while improving health outcomes for participants. In 2001, the program brought together public and private partners to establish 12 DSMES programs in underserved counties with a high prevalence of diabetes. The program recruited facilities to participate and provided resources for the programs to begin seeing patients and eventually obtain ADA recognition. As a result of the project, 11 DSMES programs received ADA recognition. From February 2003 to March 2004, DSMES participation increased 138%, and program participants improved both their preventive care practices and health outcomes” (Center for Disease Control). This program in Arkansas sought to address the high diabetes rates in counties that were at risk which was successful. Communities in Arkansas

had more access to educational programs about their disease outside of a hospital setting. These programs offer diabetes patients who are not near a healthcare facility and are not able to get care nearby an opportunity to learn more about their disease. This can help by learning more about managing their diabetes which can lead to a healthier patient.

The last policy recommendation that is suggested is to implement in Los Angeles is an incentivization for grocery stores to open up in food deserts, areas where there are hardly any places to buy food. A large proportion of diabetes can be reduced if healthy diet and exercise are available to individuals. The city of Los Angeles can give tax breaks to these grocery stores so they want to move into areas where there are hardly any grocery stores that are available. Food is a necessity for everyone and it is an important factor in keeping citizens healthy. Healthier food can even save the city money because then they will not have to pay for as many health bills nor pay for disability. Healthier citizens can save the city a lot of money so healthy food stores are an investment Los Angeles needs to make.

Conclusion

This research fills the gap in diabetes care in Los Angeles and how emergency room utilization is related to confidence levels in controlling a patient's diabetes. There are several theories as to why the emergency room is used so frequently and many theories conclude that it is because of lack of primary and preventative care. Los Angeles county has several geographic regions with high diabetes rates and there is a pattern of areas with high diabetes rates where people of color live. Understanding the populations who is most at risk and patterns is essential

to learning more about the disease. Diabetes is a complex disease and race, location, and socioeconomic are all factors in the disease, especially in a diverse city like Los Angeles.

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