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Title

The Impact of Health Education in Underserved Communities

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Abstract

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INTRODUCTION

As of 2017, 30.3 million people in the United States have diabetes and an estimated 7.2 million people are undiagnosed (*National Diabetes Statistics Report, 2017*). Current statistics estimate that 610,000 people die of heart disease every year in the United States (“Heart Disease”). Heart disease is the primary cause of death for African Americans and Hispanics - the same ethnicities that make up a majority of underserved individuals in Riverside County (“Heart Disease”).

Diabetes is a condition associated with high blood sugar levels due to the body’s inability to make or respond to insulin (“What Is Diabetes?”). Insulin is a pancreatic hormone that is released in response to high blood sugar levels to restore them to normal levels. It is a common misconception that diabetes is only present in adults; however, any age group is susceptible to this disease.

Two types of diabetes, Type 1 and Type 2, exist. Type 1 diabetes has a genetic component and is more common in children and young adults (“What Is Diabetes?”). Those with Type 1 diabetes are unable to produce insulin and thus, have high blood sugar (“What Is Diabetes?”). 18,436 individuals under the age of twenty are diagnosed with type-1 diabetes (“Statistics About Diabetes”). In contrast, Type 2 diabetes is more common in adults and is a result of the body’s inability to use insulin properly. According to the American Diabetes Association, in 2012, 208,000 individuals younger than twenty years old in the United States were diagnosed with Type 2 diabetes (“Statistics About Diabetes”). There has been a steady increase in the prevalence of Type 2 diabetes over the years.

Type 1 and Type 2 diabetes share similar symptoms including fatigue, blurry vision,

frequent urination, an increase in infections, and excessive hunger and thirst ("Statistics About Diabetes"). Loss of sensation in hands and feet is a common experience for those affected by Type 2 diabetes. Those diagnosed with Type 1 diabetes may experience nausea, weight loss, and abdominal pain ("Statistics About Diabetes").

Furthermore, diabetes has serious implications on an individual's risk for other health problems. Cardiovascular disease is the most likely implication of diabetes. Cardiovascular disease is directly related to atherosclerosis, a process in which plaque builds up in the arteries and stops the blood flow, causing a stroke or heart attack ("What Is Cardiovascular Disease?").

Risk factors associated with cardiovascular disease include family history, an unhealthy diet, physical inactivity, and high blood pressure ("*Cardiovascular Disease Risk Factors*"). Symptoms include chest pain, shortness of breath, weakness in the extremities, and pain in the upper abdomen and back ("What Is Cardiovascular Disease?"). Other symptoms include a racing heartbeat, tachycardia, or a slow heartbeat, bradycardia, dizziness, and fainting sensations ("What Is Cardiovascular Disease?"). Having pale or blue skin, swelling around the eyes, and excess fatigue can be indicators of heart disease ("What Is Cardiovascular Disease?").

The impacts of cardiovascular disease can be diminished through positive lifestyle changes such as eating healthy and exercising regularly. Physicians can also perform an angioplasty, which nonsurgically opens blocked or narrowed coronary arteries by inserting a thin, flexible tube with a balloon through a blood vessel to the blocked coronary artery. The plaque is subsequently compressed against the arterial wall and blood flow resumes ("How is Heart Disease Treated").

The increasing prevalence of diabetes and cardiovascular disease in Riverside County motivated community health projects through the Future Physician Leaders Program at the UCR

School of Medicine. The goal of these community projects was to provide health education about diabetes and cardiovascular disease, show how healthy lifestyle changes can reduce risk for these diseases, and motivate underserved individuals to take a more active role in their healthcare.

METHODS

Two separate community health projects were conducted over the span of two summers. One health project was titled “Community-Based Self-Management Education: Correlation between Diabetes and Cardiovascular Disease” and the other was “Cardiovascular Disease Prevention through Health Education, Nutrition, and Exercise in Riverside County.”

In the project correlating diabetes and cardiovascular disease, the venues were Redlands Indoor Futsal, UPS Ontario Wellness Fair, and Andulka Park. These locations were chosen by their easy accessibility to our target population of underserved families in Riverside and San Bernardino Counties. Our events consisted of handing out information pamphlets that we had created, engaging in positive conversation with participants to raise awareness about these diseases, and providing free blood pressure screenings to the community. The pamphlets addressed the communal myths of diabetes, included preventative healthcare measures, described risk factors and symptoms, and defined multiple ways of controlling diabetes. The purpose of blood pressure screenings was to educate about the different screening numbers, what they meant, and emphasize the high correlation between diabetes and cardiovascular disease.

At Andulka Park, there was also a fruit salad component that educated community members about healthy eating habits by promoting fruit, nonfat yogurt, and organic granola. There was also a physical fitness component for children that consisted of a relay race. At Redlands Indoor Futsal and the UPS Ontario Wellness Fair, granola bars and fruit snacks were distributed to participants.

The data collection aspect of our project was derived from surveys completed by community members. The first part of the survey consisted of general identity questions, including age, ethnicity, and if they had diabetes. The second half was a questionnaire formatted

with an agree to disagree scale. The “questions” were facts and common misconceptions of diabetes. This allowed us to determine if participants believed more in the common misconceptions over the facts. Overall, the surveys were used to evaluate the existing knowledge of diabetes and cardiovascular disease in the community from our participants’ answers.

The second project which focused on cardiovascular disease took place at Riverside Public Library. One component was physical fitness activities for youth. The activities included hopscotch, duct tape maze, and a relay race. A second component focused on healthy eating was a salad bar with lettuce, avocados, walnuts, apples, strawberries, bananas, and grapes. The third component was an educational presentation on cardiovascular disease on the description, risks, effects, and ways to prevent cardiovascular disease. For active participation, raffle tickets were passed out to those who participated by answering questions throughout the presentation. After the presentation, basic fitness exercises including push-ups, toe touches, sit-ups, and squats were taught to participants. The goal was to illustrate ways to stay physically active in the comfort of one’s home. The conclusive part of this event was a raffle consisting of a \$25 Stater Brothers’ gift card, a basket of fruit, jump ropes, balloons, and whistles.

To assess results, two separate surveys were created, one for youth and one for adults. The children’s survey was more general about their lifestyle and included pictures on what activities they normally do, what they enjoy eating and drinking, and basic questions about their city and family. On the other hand, the adults’ survey asked about what they knew before and after the presentation and whether they are going to implement what they learned from our health fair to their daily lives.

RESULTS AND DISCUSSION

Both projects, “Community-Based Self-Management Education: Correlation between Diabetes and Cardiovascular Disease” and “Cardiovascular Disease Prevention through Health Education, Nutrition, and Exercise in Riverside County,” obtained data on adults and child participants through surveys. The surveys for the project correlation diabetes and cardiovascular disease were a measure of determining how much the community knows about each disease, while the project focused solely on cardiovascular disease surveyed community members to gauge their current health habits.

The data for “Community-Based Self-Management Education: Correlation between Diabetes and Cardiovascular Disease” is based off seventy-three surveys with forty-nine from adults and twenty-four from youth. Compared to the youth, 27.66% adults reported knowing someone with diabetes, whether that was a family member or a friend (Fig. 1).

Since our participants were aged as young as two years old, it is a possibility that the children might know someone with diabetes and not be aware of it.

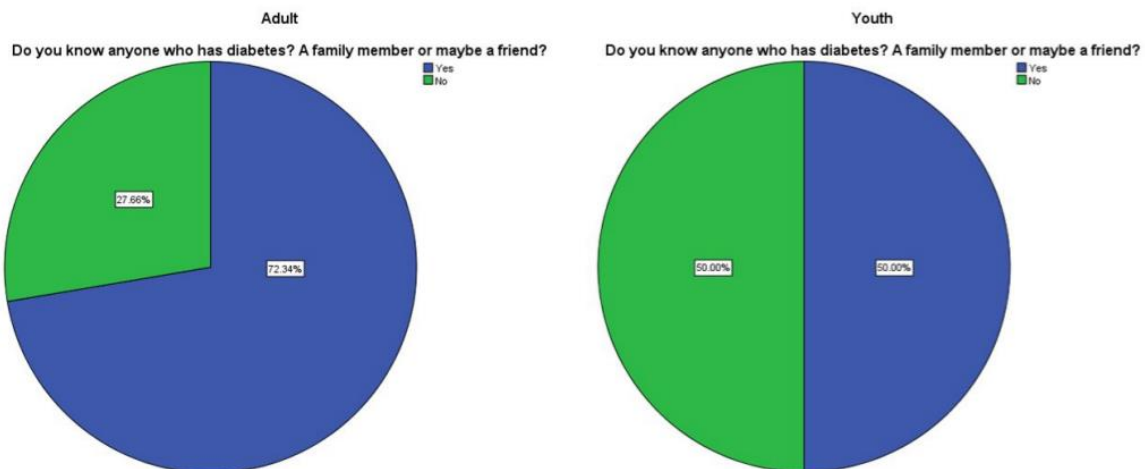


Figure 1 Most adults claimed that they knew either a friend or family member with diabetes. The results for children were split exactly in half, but a few children were confused by this question so that could have affected the results.

Approximately the same proportion of adults and youth, 85.71% and 87.5% respectively, have participated in an educational program about diabetes. These similar proportion of adults and youth could be due to families attending educational programs together, hence the similarity between youth and adults in this category (Fig. 2).

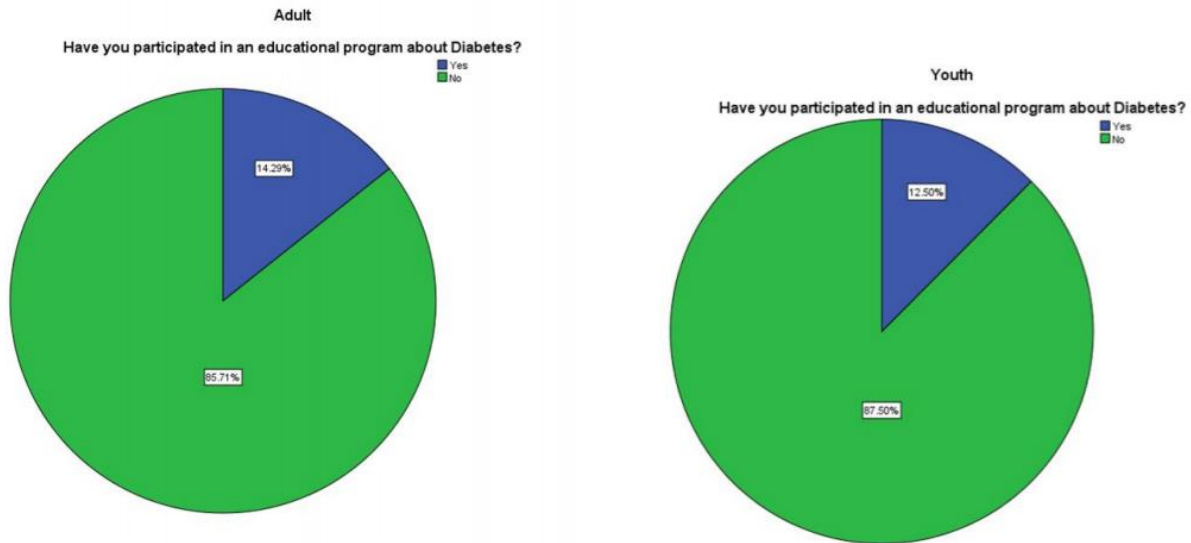


Figure 2 Many adults and youth have participated in educational programs about diabetes, indicating their awareness of the prevalence of diabetes in their community.

One statement that had largely varying responses between the two age groups was “There is no scientific connection between a healthy diet and good health.” While a majority of the adults were on the right track, 68.83% percent to be exact, only 37.5% of the youth knew that this statement is false (Fig. 3). Both adults and youth correctly agreed that eating healthy is not expensive, specifically 55.11% of adults and 50% of youth (Fig. 4). One question that differed between the adult and youth surveys was to gauge each group’s understanding of their current risk factor for developing diabetes, either from cardiovascular disease for adults or from a diabetic parent for youth. Sixty-two percent of adults correctly answered that having diabetes is correlated with a higher risk of cardiovascular disease.

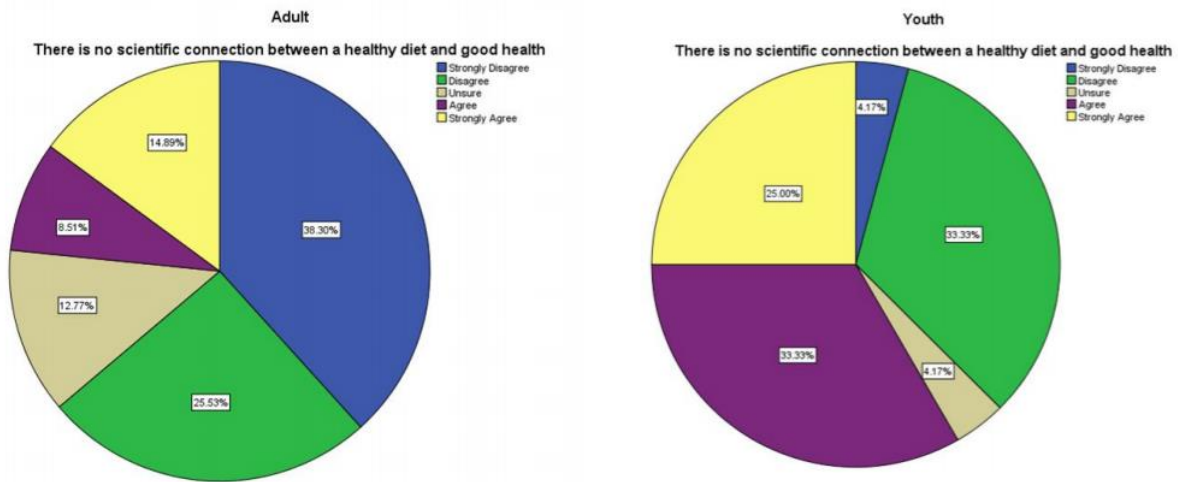


Figure 3 Most of the adults identified this statement correctly as false, whereas the youth did not seem to have a good understanding of this concept. Research shows that there is a scientific connection between diet and health.

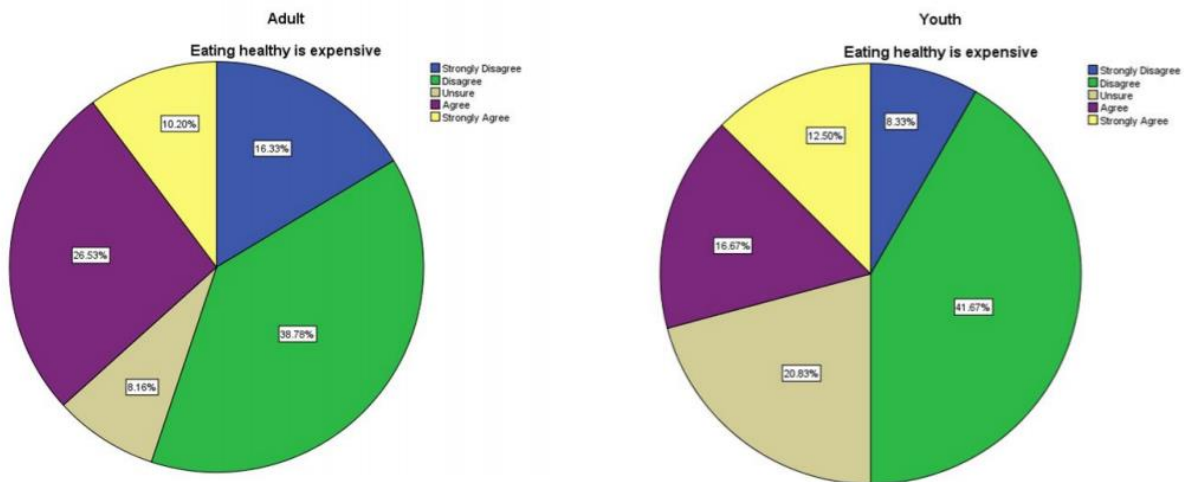


Figure 4 Adults and youth correctly agreed that eating healthy can be inexpensive. During our presentation, we discussed methods such as using coupons and buying in bulk to lower costs of healthy eating. We also encouraged freezing leftovers to reduce food waste and increase affordability of healthy ingredients.

Approximately forty-seven percent of youth, which is almost half, believed that having a diabetic parent does not increase their chance of becoming diabetic (Fig. 5).

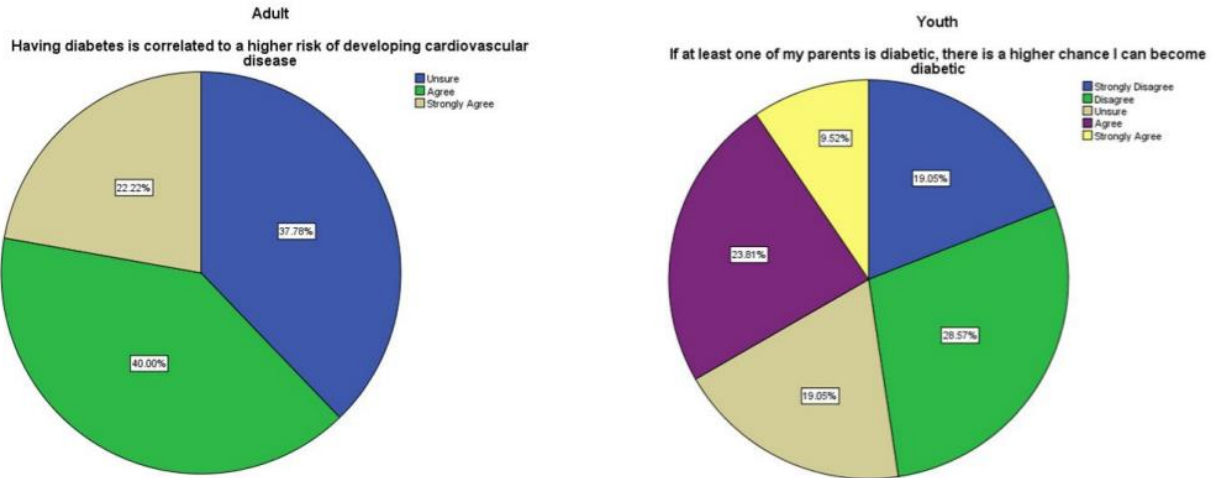


Figure 5 Half of the youth incorrectly believed that having a diabetic parent would not increase their chances of having diabetes. Although genetics do play a role, one main reason why this statement is incorrect is because the lifestyle habits of children reflect those of their parents. So, parents who consistently eat unhealthy or do not exercise can transmit those behaviors to their children who can then be more prone to diabetes.

We also assessed whether participants believed that medication is more important in controlling diabetes than diet and exercise. A majority of adults, specifically 69.38%, correctly stated that lifestyle changes are more important than medication (Fig. 6).

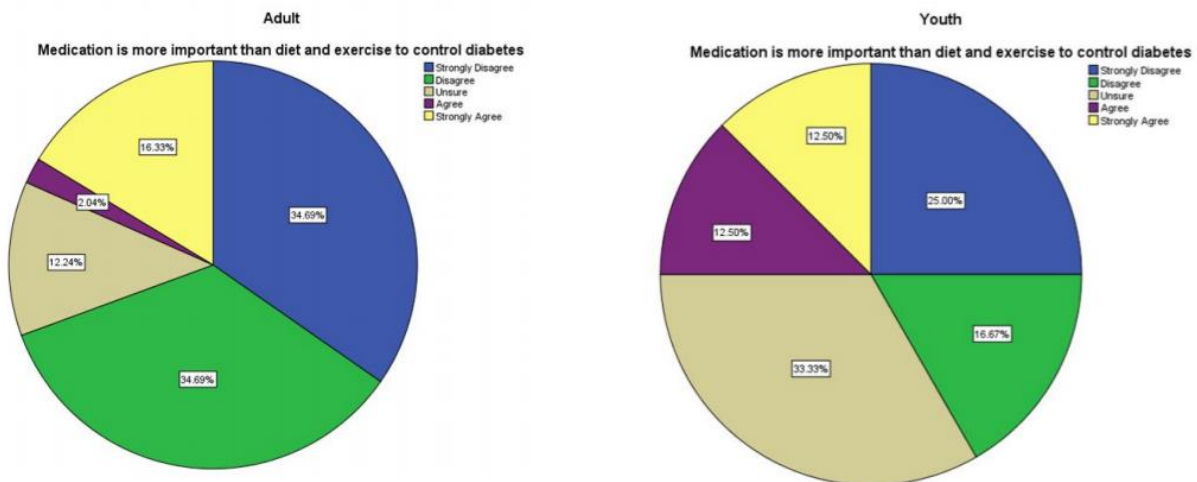


Figure 6 Most of the adults correctly recognized that lifestyle habits like diet and exercise play a bigger role in controlling diseases, such as diabetes, as opposed to medications.

Youth, on the other hand, were more confused about this question because many of the younger children did not know what the word “medication” meant and thus this question is not an accurate assessment of their knowledge about these diseases. We also asked participants if they felt that people with diabetes should never eat sweets, desserts, or sugar. 34.78% of the adults answered this question correctly and stated that people with diabetes should not be prohibited from eating sugary foods (Fig. 7). Similarly, 20.84% of children answered this question correctly (Fig. 7).

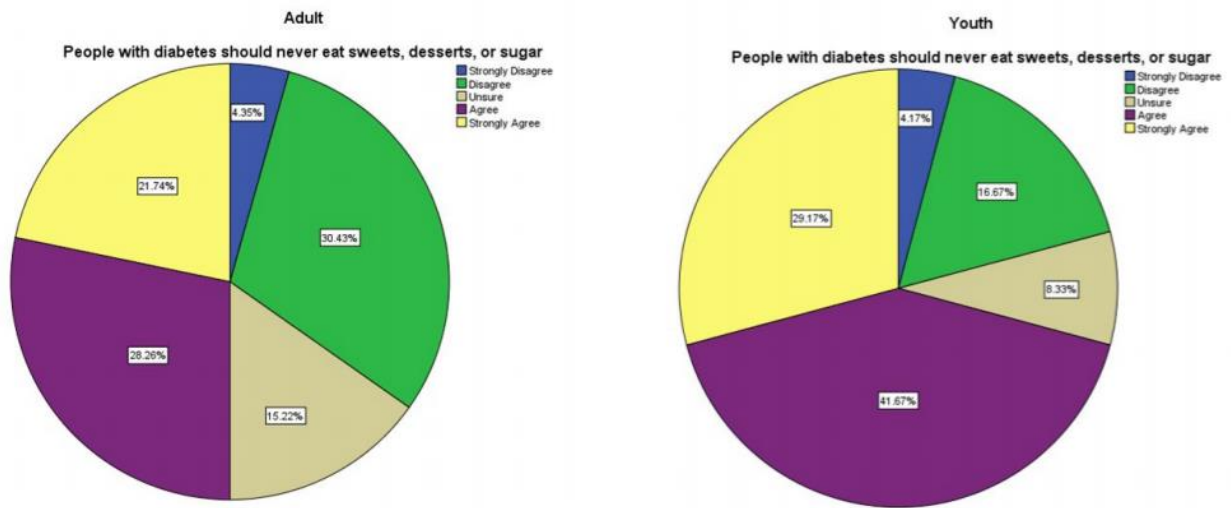


Figure 7 Both adults and youth incorrectly believed that an individual with diabetes is completely prohibited from sweets, desserts, or sugar. On the contrary, those with diabetes can enjoy sweets and sugary foods in moderation.

The results from this question show that the community is slightly misinformed about the dietary restrictions, which we clarified during the educational presentation. Knowledge about becoming blind due to uncontrolled diabetes was also assessed. Research shows that diabetes can increase the risk of eye conditions, but does not directly lead to blindness. Only 4.35% of adults answered this question correctly and surprisingly, more youth answered this question correctly with a total of 33.33% correct responses (Fig 8).

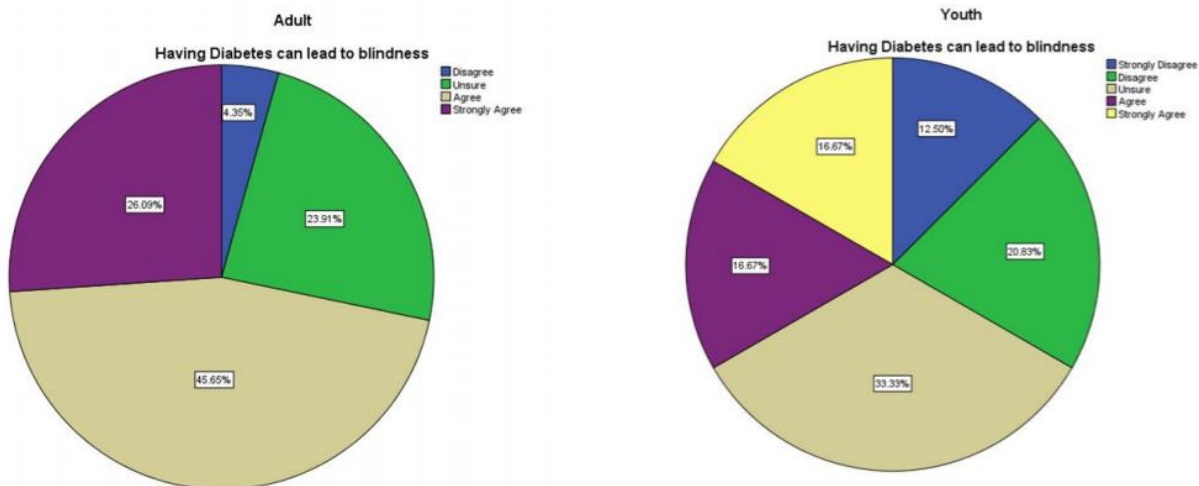


Figure 8 Youth, as opposed to adults, correctly identified that diabetes often does not lead to blindness.

Furthermore, we gauged whether the community knew about diabetes’ most prevalent symptoms. Over 80.43% of adults answered this question correctly and 29.16% of youth answered this question correctly (Fig. 9).

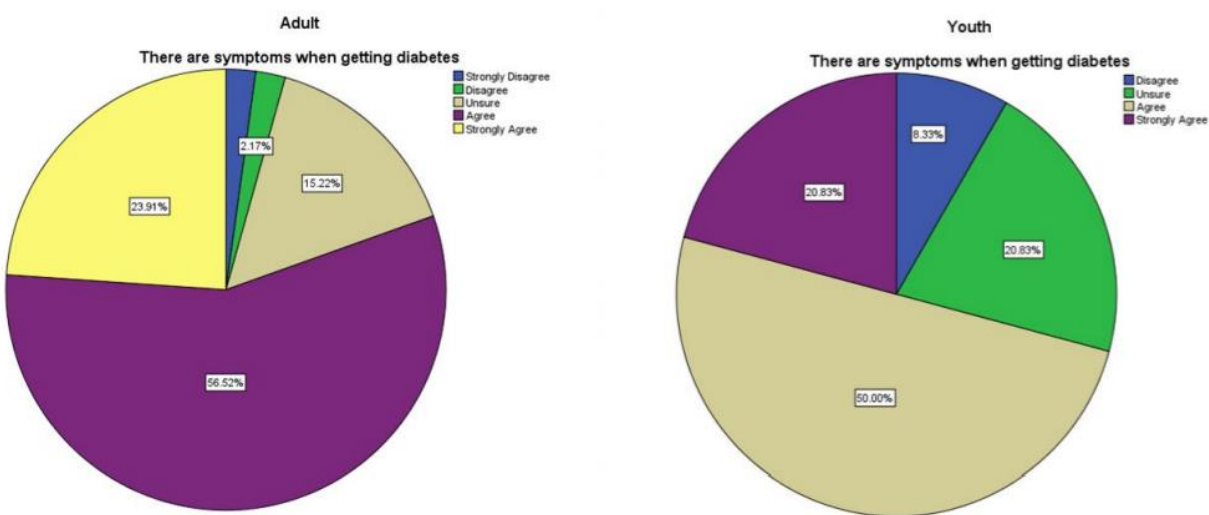


Figure 9 Adults are more aware of diabetes’ symptoms than children, as expected. Awareness of symptoms is an important factor for detecting and treating diseases, like diabetes.

In addition, 78.26% of adults correctly agreed that thirty to forty-five minutes of exercise is

recommended to maintain body weight and 95.83% of youth also correctly answered this question (Fig. 10).

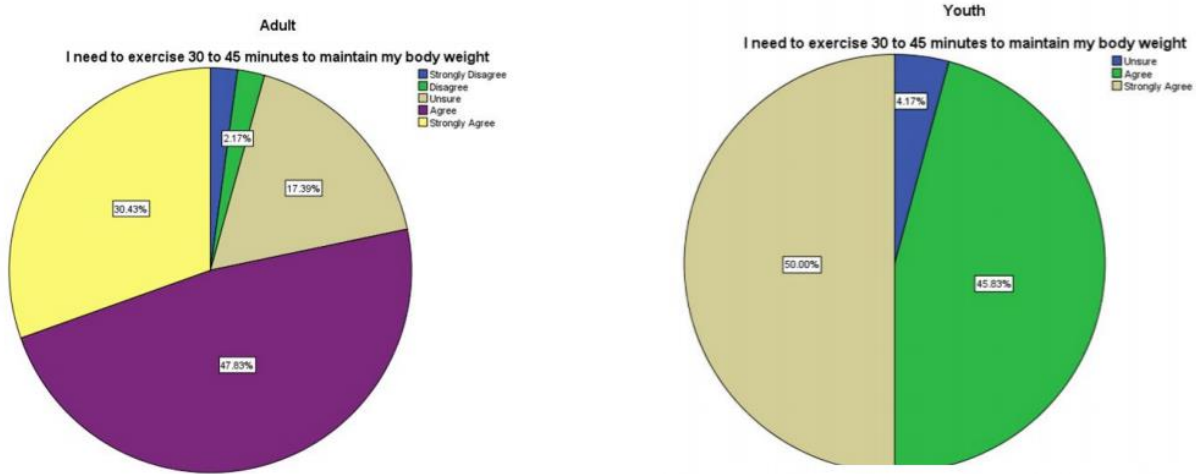


Figure 10 Many adults and youth correctly identified that thirty to forty-five minutes of exercise per day is ideal for maintaining constant body weight. We understand that other factors like diet and stress can also contribute to body weight, and communicated this to the participants.

The data for “Cardiovascular Disease Prevention through Health Education, Nutrition, and Exercise in Riverside County” is based on forty-seven surveys, specifically thirty-one adults and sixteen children. Most of the adults were Hispanic (46%) with two other ethnic groups represented (Fig 11).

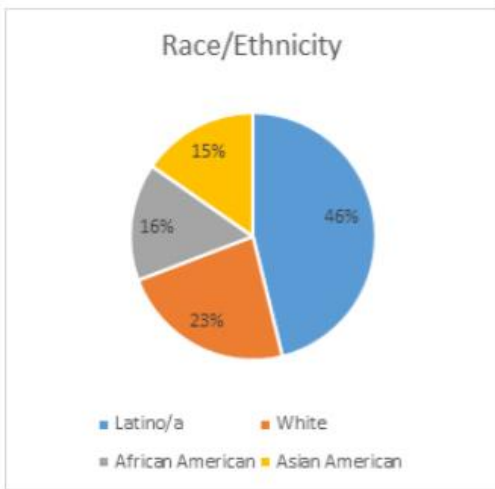


Figure 11 The demographics of our participants were forty-six percent Latino, twenty-three percent White, sixteen percent African American, and fifteen percent Asian American.

The adults ages ranged from the early 20's to the late 50's and they were all residents of Riverside-San Bernardino area. According to the survey, sixty percent of the adults were female (Fig 12).

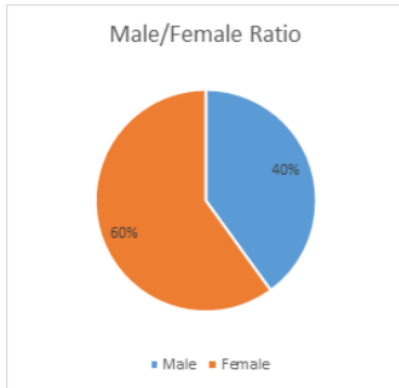


Figure 12 Our participants consisted of sixty percent females and forty percent males.

Additional questions about the adults' health care access and health behaviors and attitudes were included. Ninety-two percent of adults had a primary care physician (Fig. 13).

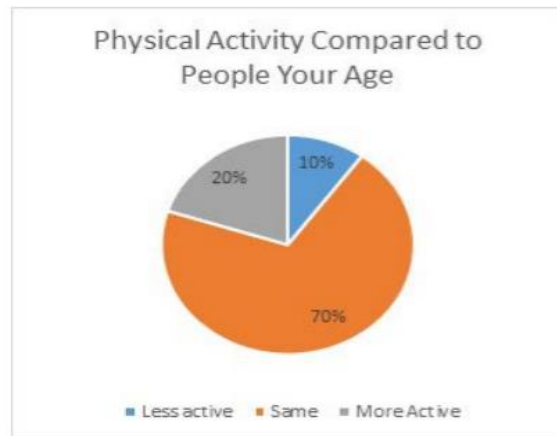
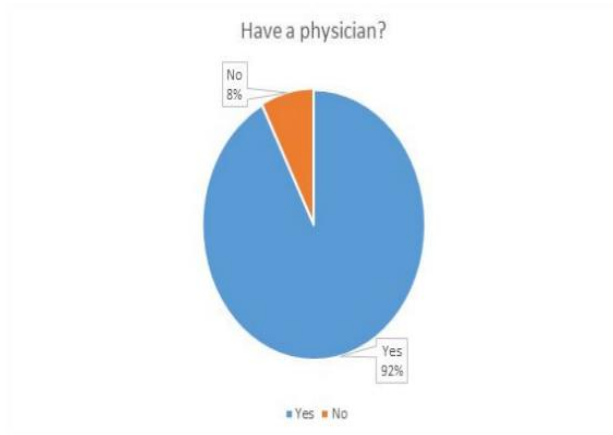


Figure 13 (left) Almost all the adult participants had a physician.

Figure 14 (right) A majority of the adult participants stated that they were involved in at least the same amount of physical activity as other people of their age, if not more. This question was included because physical activity is an important factor contribution to one's health.

Seventy-percent of the adult participants stated that they were involved in approximately the same amount of physical activity as compared to people of similar ages, twenty percent said they were more active, and ten percent reported being less active (Fig. 14). A majority of the adult

participants, ninety-three percent to be exact, stated that their cardiovascular health is of importance to them (Fig. 15).

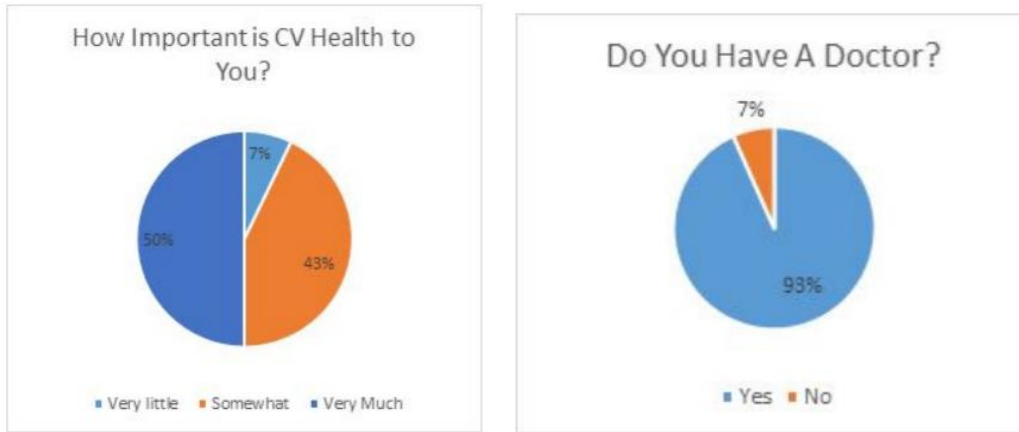


Figure 15 (left) Cardiovascular health was important to almost all adult participants. **Figure 16 (right)** The same percentage of children as adults had doctors, as expected.

The data for the children consisted of surveys completed by three boys and thirteen girls aged two to fourteen years old. Fifteen of the sixteen children had a primary care doctor (Fig. 16). In addition, we assessed how children prefer to spend their free time and a majority stated that they preferred either playing outside or playing on electronic devices. Thirty-eight percent of the children reported that they spent their free time playing outside, thirty-seven percent reported playing electronics, and twenty-five percent reported reading in their spare time at home (Fig. 17).

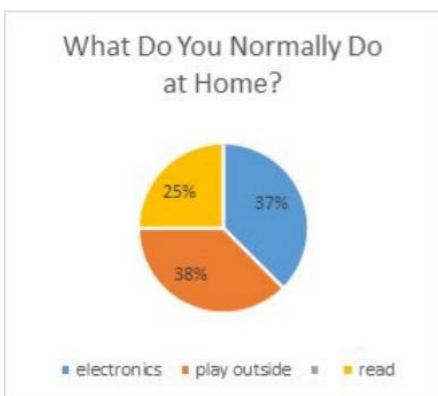


Figure 17 Most children either played outside or played with electronic devices instead of reading during their free time at home.

For dietary preferences, most of the children prefer fast food and fruit, while the rest prefer sweets. Thirty-seven percent like to drink soda, thirty-one percent prefer water, nineteen percent prefer juice, and the remaining thirteen percent report milk as their drink of choice (Fig. 18).

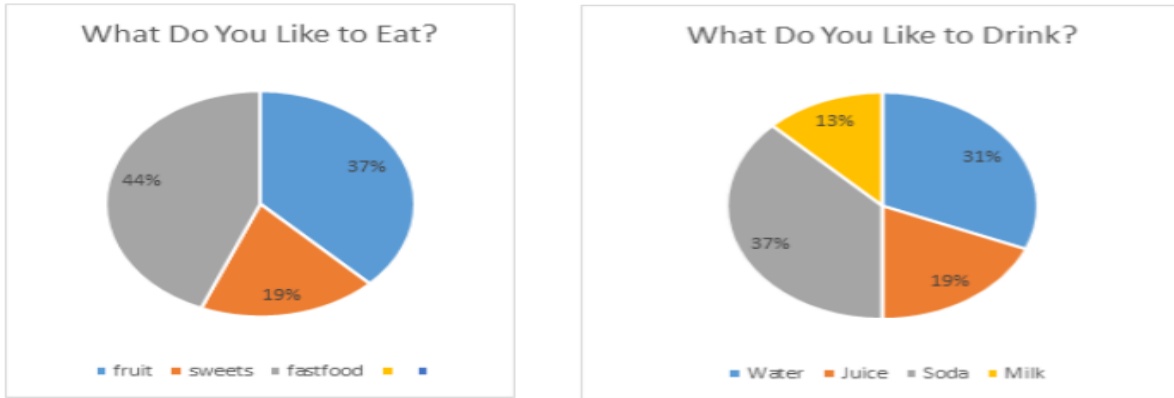


Figure 18 The dietary preferences of the children were mostly unhealthy with most children preferring fast food. However, it was surprising that children preferred fruit over other sweets. Although soda was the most preferred drink by children, water was a close second with juice in third place and milk in last place.

Eighty-percent of the children stated that the heart was the most important body part according to them (Fig. 19) and about fifty-three percent reported that they knew what the heart looks like (Fig. 20).

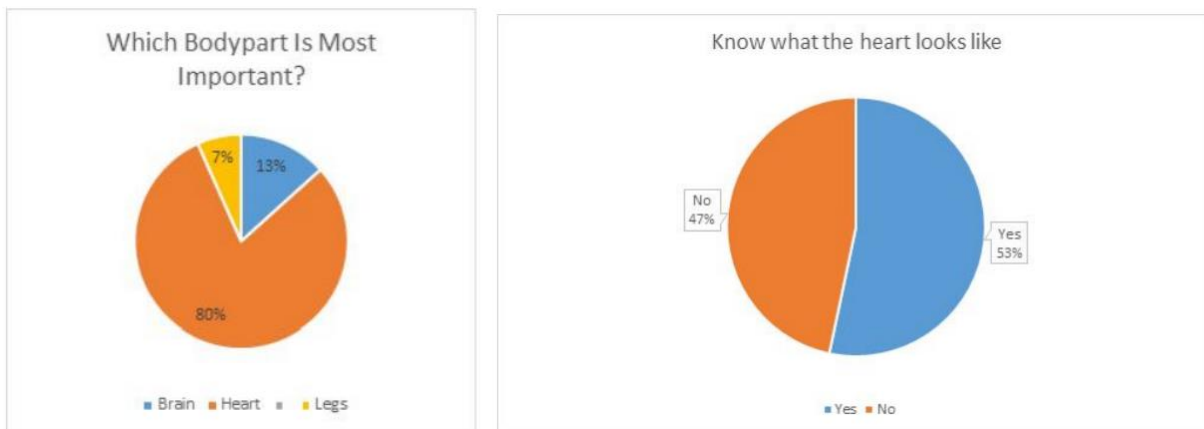


Figure 19 Most children believed that the heart has the most important body part, followed by the brain and lastly legs.

Figure 20 (right) Over half the children stated knowing what the heart looked like and many of them were correctly able to identify it during our presentation.

CONCLUSION

This project highlights the positive impact of health education on underserved communities by illustrating that it not only motivates individuals to change their lifestyle habits, but also provides feasible options to achieve their goals. Through this experience, I learned that one of the most effective ways to conduct community outreach is by choosing locations that are frequently visited by the population of interest. By hosting both of the projects in family-friendly parks and community centers, I realized that community members were more receptive to information and more willing to implement the tips provided. In addition, the projects were rewarding because community members were very grateful for the resources provided because the options were affordable and manageable. Future Physician Leaders has been an incredibly memorable experience during my time as an undergraduate student and has motivated me to continue providing health education as a physician in the future.

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