

# The Combined Effects of Culture and Social Support in Diabetic Foot Care Within Hispanic Communities

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## 1) Abstract

It has been shown that type 2 diabetes is both genetically and environmentally linked, and the focus of our study was to observe how lifestyle choices may play a role in diabetes, especially within the Hispanic community.<sup>1</sup> In regards to health disparities, previous lower extremity studies have shown a correlation between lower socioeconomic standing with decreased foot health, but none have taken account for cultural factors that are everyday variables in their lives.<sup>2</sup> The hypothesis in our study is that certain aspects of the social history of the Hispanic community have negative impacts on their foot care and diabetes management. Surveys were conducted at Arrowhead Medical Center among 119 individuals of Hispanic heritage, 18 years and older; in addition, the surveys were translated into Spanish for non-English speaking respondents. Based on participant’s answers, we observed how factors such as economic issues, social issues, and family involvement affected their diabetic foot care. Diet was shown to be a leading factor with significant correlations between normal meals consisting of rice, beans, fast food, and sweet drinks and having increased blood glucose levels. Over 15% admit they have not changed their diet since being diagnosed with diabetes. 65% of the correspondence reported numbness in their feet and yet over 60% claimed to cut their own nails, which is advised against due to the increased risk of infection. Only 18% of respondents stated they would seek out a podiatrist if they thought they had a foot infection. All these correlations and percentages demonstrate that more insight is needed to better understand the multifactorial approach to caring and educating this population.

## 2) Introduction

The Hispanic population is one of the fastest growing minorities within the United States; however, there has not been an overall improvement in reported health quality within this community. Mexican Americans, for example, suffer from disproportionately higher rates of type 2 diabetes and its associated complications than the general population.<sup>3</sup> The disease itself presents with long-term effects that include kidney failure, cardiovascular disease, foot ulcers, retinal damage and various other chronic conditions that will significantly decrease the patient’s quality of life. Aside from just diabetes, the Hispanic communities have higher morbidity due to cardiovascular disease and obesity.<sup>4</sup> These chronic conditions often lead to foot complications consisting of lack of nerve sensation from diabetes, poor circulation to the feet from peripheral arterial disease, and foot pain from obesity. Because of this, there is a need to closely examine the health disparities among the Hispanic community that has resulted in poorer health outcomes and its impact on foot-related conditions. Examining the combined effect of social and cultural factors is significant in tailoring an effective foot care treatment and management plan for Hispanic patients and thus can reduce the risk of amputations. In addition, foot health has such a strong correlation with diabetes that it is essential that a podiatrist be involved as part of the diabetes care and management team. Evaluating the health disparities of Hispanics requires the consideration of social history in combination of the cultural aspect that play a role in their reported foot health complications; all of which may further the cultural competence and betterment of self-care and foot care management.

Past lower extremity published research has shown that Hispanics are disproportionately affected with higher rates of lower limb amputation related to diabetes.<sup>5</sup> In this study, the hypothesis was that the higher incidence rate could be due to the higher prevalence of vascular disease, neuropathy, and history of lower-extremity complications; however, this hypothesis was not supported by the data and suggest that other variables are involved which requires further investigation. These variables attributed to the higher amputation risk could be due to the differences in access to care, patient education, patient compliance, self-care management, and cultural issues.

One of the hypotheses in this study is that social history in the life of Hispanics as well as cultural factors plays a significant role in their reported foot care and diabetes management. The need to explore cultural as well as social history risk factors in health among Hispanics is imperative and may provide some potentially effective management strategies to improve not only foot health but also overall health outcomes for the Hispanic community. Social support is critical to the well-being and care of those with chronic illnesses and can greatly affect stress management, balancing glucose levels, encouraging a low-fat diet, and helping maintain a healthy weight through physical activity. Furthermore, allowing evident disparities in education and other socioeconomic factors to continue among the Hispanics will only worsen the health disparities that greatly impact many Hispanics’ health outcomes today.

## 3) Methods

We collected data from Hispanic patients with diabetes within the podiatry clinic at Arrowhead Regional Medical Center in Colton, California.

Surveys were collected between June to August in both 2016 and 2017. The sample size of 119 Hispanic participants were used to gather data from them. Participants were selected if they were Hispanic and 20 years or older. All personal information was kept confidential and anonymous adhering to the protection of the human subjects and respondents. This research study also received IRB (Institutional Review Board) approval from the Western University of Health Sciences. The participants were always instructed on what to expect with involvement in the research study including time commitment (less than 10 minutes), purpose of the study, and the right to withdraw from the study at any time. The study information sheet/cover letter was written in English and then translated to Spanish. This study information sheet/cover letter was utilized to help the respondents determine whether they would like to take the survey or not.

The survey was 2 pages long, and 21 questions. Surveys asked participants to answer questions about their demographics, past medical history, dietary habits, and diabetic care. The surveys were also translated into Spanish for non-English speaking respondents. The staff podiatrist examined each potential participant to identify any lower limb complications and risk factors related to diabetes such as past history of lower extremity pathology in ulcers, neuropathy, peripheral vascular disease, and foot pathologies/deformity. Some questions included “how often do you check your feet? Do you have numbness in you feet or ankles?” And even “what color socks do you wear.” Diabetic Patients are advised to wear white socks in case they suffer an injury, so that they will see blood on their socks when they take them off. See Figure 1 to see a breakdown of all questions asked on Survey. Information was also gathered either from them or their medical records about their glucose levels and Hemoglobin A1C score. This information was then converted to numerical data so that the data could be analyzed using SPSS statistics software.

Age: \_\_\_\_\_ Weight: \_\_\_\_\_  
Height: \_\_\_\_\_ Circle one: Male Female  
1. How do you personally manage your diabetes? (May circle more than one)  
Insulin Oral medications Traditional herbs/remedies Diet Exercise  
2. Do you take any traditional supplements or herbs for your health such as from your home country to manage your diabetes?  
Yes No  
If so, what did kind of traditional supplements or herbs do you take?  
\_\_\_\_\_  
3. Does your family help you maintain a healthy diet?  
Yes, very much Yes, somewhat Yes, a little No  
4. A normal dinner at home includes which of the following (may circle more than one)?  
Tortillas/tacos Rice Beans Chicken Vegetables "Fast food" Sweet drinks  
5. Do you feel that you maintain a healthy diet?  
Yes, all of the time Yes, most of the time Yes, some of the time No  
6. Has the food your family prepares changed since you developed diabetes?  
Yes, very much Yes, somewhat Yes, a little No  
7. Have economic issues such as low income, unemployment, poverty ever affected how you manage your diabetes?  
Yes, very much Yes, somewhat No  
8. Have social issues such as racial/ethnic discrimination, family violence, lack of affordable childcare ever been a problem or concern to you?  
Yes, very much Yes, somewhat No  
9. How often do you check your feet?  
Twice a day Once a day Once a week Rarely  
10. Are you able to check the bottom of your feet?  
Yes, with a mirror Yes, family helps me Yes, I am flexible enough No

Figure 1:

11. Does your family help or remind you to check your feet?  
Yes, often (daily) Yes, rarely (~ once a week) No  
12. Do you have numbness of your feet or ankle?  
Yes, a lot Yes, some Yes, a little No  
13. On a scale of 0-10, how much pain do you have in your feet or legs?  
0 1 2 3 4 5 6 7 8 9 10  
14. Who normally cuts your toenails?  
I do it myself My family Podiatrist Pedicurist  
15. Do you ever walk barefoot?  
Yes, around the house Yes, around and outside the house No, never  
16. What color socks do you wear?  
\_\_\_\_\_  
17. Have you ever had a sore or ulcer on your feet?  
Yes No  
18. If you develop a sore or ulcer on your feet, what do you believe is the best way to treat it?  
Visit your primary care doctor Visit the emergency room Treat it yourself with bandages  
19. Have you ever used traditional medicines to treat your soles or ulcer? If so, which kind?  
No Yes: \_\_\_\_\_  
20. If you thought you had a foot infection, what would you do?  
Schedule an appointment with your primary care doctor Visit the emergency room immediately  
Schedule an appointment with the foot doctor Try a traditional medication first and wait  
21. Have you ever had an amputation of your feet or toes?  
Yes No  
PHYSICIAN SECTION ONLY (Please fill out the information below on the patient)  
Last glucose: \_\_\_\_\_  
Last HbA1C: \_\_\_\_\_

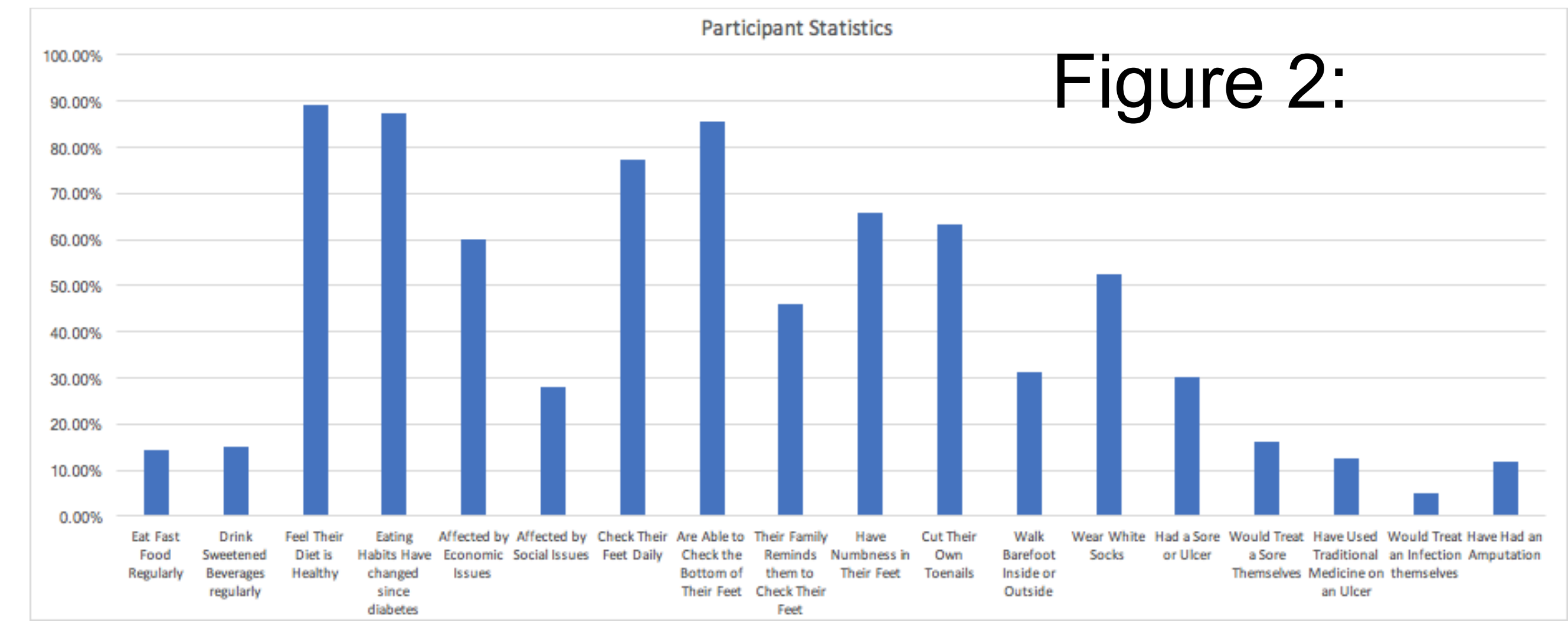


Figure 2:

Figure 3:

| Response items correlated with HbA1C level                    | Pearson correlation (r) | p-value |
|---|-------------------------|---------|
| Manage diabetes with insulin                                  | 0.248                   | 0.016   |
| Weight  | -0.188                  | 0.097   |
| Last Glucose  | 0.489                   | 0.00    |
| Social Issues   | -0.184                  | 0.074   |
| Vegetables  | -0.198                  | 0.055   |
| Response items correlated with Glucose level                  |                         |         |
| Manage diabetes with diet                                     | -0.185                  | 0.062   |
| Normal dinner at home includes rice                           | 0.19                    | 0.053   |
| Normal dinner at home includes beans                          | 0.181                   | 0.065   |
| Normal dinner at home includes fast food                      | 0.188                   | 0.055   |
| Normal dinner at home includes sweet drinks                   | 0.252                   | 0.01    |
| Feels they maintain a healthy diet                            | -0.310                  | 0.01    |
| Last HbA1C  | 0.489                   | 0.00    |
| Response items correlated with having an amputation           |                         |         |
| Gender  | -0.214                  | 0.021   |
| Normal dinner at home includes tortilla                       | -0.2                    | 0.03    |
| Family reminds them to check their feet                       | 0.183                   | 0.052   |
| Have numbness   | 0.155                   | 0.096   |
| Have sore/ulcer   | 0.384                   | 0.00    |
| Response items correlated with having a sore or ulcer on feet |                         |         |
| Age   | -0.188                  | 0.043   |
| Height  | 0.195                   | 0.058   |
| Rice  | 0.191                   | 0.037   |
| Social Issue  | 0.199                   | 0.031   |
| Can check their own feet                                      | 0.222                   | 0.016   |
| Have used traditional medicine on sore/ulcer                  | 0.191                   | 0.038   |
| Had an amputation of their feet or toes                       | 0.384                   | 0.00    |

## 4) Results

There were 119 completed surveys. The average age is 58, with a mode of 63, and a range of 26-82. There were 67 women and 52 men respondents. After analyzing the data using SPSS, we discovered several correlations that were significant. See figure 3 for how response items correlated with hemoglobin A1C levels specifically. Looking at the second group in figure 3, response items were correlated with glucose levels, and we can see that drinking sweet drinks regularly is highly correlated with a high glucose level, with a p value of 0.01. The average HbA1C was 7.86 and the average glucose was 163.77. 30% of participants have had an ulcer, and 12% have had an amputation. 14% of participants eat fast food regularly, 15% regularly drink sweetened beverages, and 89% feel they have a healthy diet. 66% of participants have numbness in their feet, while 63% of participants cut their own toenails. 60% of participants say economic issues have affected their treatment of diabetes, and 28% say that social issues have affected their treatment. Less than half, 46%, of participants have family members that remind them to care for their feet. Figure 2 is a chart showing the percentages of participant’s responses on specific questions. Almost 90% of participants feel their diet is healthy, yet over 10% say they eat fast food regularly. Over half do not wear white socks even though it has been shown to help reduce infections and ulcers in those with neuropathy. Over 65% have numbness in their feet, 30% have had an ulcer, and 12% have had an amputation. Over 60% cut their own toenails, which is advised against when you have any numbness. Over 12% say they have not modified or changed their diet since being diagnosed with diabetes. Only 38% said they manage their diabetes with exercise. 14% of respondents said they used traditional herbs / supplements to manage their diabetes. Only 26% of patients say their family is very helpful at maintaining a healthy diet for diabetes. 23% of the participants did not check their feet on a daily basis and that could be in part due to the fact that 53% of patients do not have family members that remind them to check their feet. Even though diabetics should never walk around barefoot, 31% claim to walk around barefoot at least some parts of the day. One of the most alarming findings was that only 18% claimed they would seek help from a podiatrist if they thought their foot was infected.

## 5) Conclusion

Based on participants’ answers, we can see how factors such as economic issues, social issues, and family involvement can play a big role in the management of diabetes in the Hispanic population. We can also note how diabetes management that is affected by social issues correlate to having a sore/ulcer on the foot which often can lead to an amputation. Diet also plays an important role, seeing as there are relatively significant correlations between normal meals consisting of rice, beans, fast food, and sweet drinks with having a higher last glucose level. We can also note the correlation between “last glucose level” and “management of diabetes with diet” with an r-value of -0.185 and a p-value of 0.062. All of this pointing towards how having a poorly managed diet can correlate with a higher glucose level. What is clear from all these correlations and percentages is that more insight is needed to better understand the multifactorial approach to caring and educating this population. Education will be key in helping the diabetic epidemic that is prevalent within the Hispanic community. Possibly the first step is recognizing that this disparity in treatment exists and is in large part due to social and cultural trends within the Hispanic community.

## 6) References

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## 7) Acknowledgements

Western University of Health Sciences’ Student Summer Research Fellowship Grant