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HISPANIC COOKBOOK FOR INDIVIDUALS WITH DIABETES

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HISPANIC COOKBOOK FOR INDIVIDUALS WITH DIABETES

A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

in

Nutrition Science

by

Jewel Santamaria

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ABSTRACT

Introduction: Can a cookbook positively influence the quality of life for Hispanics with diabetes? The purpose of this study was to develop a cookbook that is diabetic-friendly and culturally appropriate using common traditional Hispanic ingredients and methods.

Methods: Recipes for traditional Hispanic dishes were modified to meet nutritional needs for people with diabetes. The modified recipes were very similar to traditional Mexican cuisine, except healthier ingredients and techniques were substituted from the original recipes. Nutritional analysis was conducted using Cronometer software, with inclusions of calories, protein, carbohydrates, and fat in the cookbook. Additionally, a carbohydrate exchange for each recipe was included in the cookbook. Nutrient contents were compared between traditional and modified recipes.

Results: The modified recipes meet nutritional goals for people with diabetes. The recipes also meet diabetic guidelines and significantly lowered fat and energy contents. Therefore, the cookbook was successful in meeting nutritional needs for people with diabetes based on the Diabetes Exchanges developed by the American Diabetes Association (ADA) and the Academy of Nutrition and Dietetics (AND).

Conclusion: This project was designed to create a Hispanic cookbook for people with diabetes to empower them to prepare and eat healthy, while meeting

their food preferences and their nutritional goals. The project was successful at meeting this goal.

Word count: 209

Key word: Type 1 Diabetes Mellitus, Type 2 Diabetes Mellitus, Gestational Diabetes Mellitus, Prediabetes, Insulin, Pancreas, Blood glucose

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CHAPTER ONE

INTRODUCTION

Problem Statement

Diabetes is increasing at an alarming rate in the United States. According to the “Centers for Disease Control and prevention” (CDC) as stated in the (National Diabetes Report 2022). Cases of diabetic have increased to 37.3 million, affecting 11.3% of the United states population. There are 28.7 million people that have been diagnosed with diabetes and 8.5 million people have diabetes but have not yet been diagnosed (National Diabetes Report 2022). There are 1.45 million people in the United States living with Type 1 Diabetes (T1D), which accounts for about 3.75% of all diagnosed cases of diabetes. In 2019 there were 283,000 children and adolescents under 20 years of age who had been diagnosed with diabetes. This includes 244,000 with T1D (National Diabetes Report 2022).

Diabetes is a chronic disease that is seen in abnormal elevated levels of blood glucose, which leads over time to serious damage to the heart, blood vessels, eyes, kidneys, and nerves (National Diabetes Report 2022). The most common type of diabetes in adults is type 2 diabetes (D2M), which occurs when the body becomes resistant to insulin or does not produce adequate insulin to effectively control the blood glucose. Individuals with D2M are able to control their blood glucose using oral medications and lifestyle changes including dietary

modification and physical activities. In the last 30 years, the prevalence of type 2 diabetes has increased dramatically.

Type 1 diabetes (T1D) also known as insulin-dependent diabetes or formerly known as juvenile diabetes, is caused by an autoimmune disease in which the pancreas produces little or no insulin due to destruction of beta-cells of Islets of Langerhans in the pancreas or inadequate insulin production. These individuals depend on exogenous insulin injection and dietary modification to maintain their blood glucose concentration (National Diabetes Report 2022). It affects 10% to 15% of people with diabetes.

Diabetes is caused by the body's inability to create or effectively use the endogenous insulin, which is produced by the beta cells of the Islet of Langerhans cells in the pancreas (National Diabetes Report 2022). Insulin is essential for the body to maintain homeostasis and metabolism. Insulin helps to regulate blood glucose levels and provides energy to cells and tissues. Without insulin, the cells are deprived of glucose, leading to "starvation" and cause metabolic changes that may affect the homeostasis status of the body. People with T1D must have exogenous insulin by injection or a pump to survive. People with T2D can control their blood glucose by oral medications and following a healthy meal plan based on the Diabetes Exchange System. They may also follow the portioned-controlled Mediterranean diet, increased physical activity and exercise, losing excess weight, and taking oral medications, if needed and prescribed by their physician. Exogenous insulin may be used to control blood

glucose in people with type 2 diabetes if the oral medications are no longer effective in lowering blood glucose (National Diabetes Report 2022).

Diabetes can affect many parts of the body and is associated with diseases such as heart disease, stroke, blindness, kidney failure, amputation and kidney disease (National Diabetes Report 2022). Diabetes was the seventh leading cause of death in the United States in 2017 based on the 83,564 deaths reported in which diabetes was the underlying cause of death. Diabetes was also listed as the main cause of death on 270,702 deaths reported in 2017 (National Diabetes Report 2022). Diabetes impacts all social, economic, and ethnic backgrounds, and the aim of this study will be focused on the Hispanics population who may also have limited resources. This population is also more susceptible to type 2 diabetes mellitus. According to the (Center for Disease Control and Prevention CDC) Hispanics are more likely to have type 2 diabetes mellitus than other ethnic groups due to many factors including biological, environmental, and social factors.

Purpose of Study

The purpose of this study is designed to empower people with diabetes to prepare and eat healthy using a Hispanic Cookbook for individuals with Diabetes. The cookbook will allow Hispanics to adhere to a diet for people with diabetes using the ingredients that meet their food preferences while still meeting their nutritional goals. The cook book is based on dishes that meet the need for culturally appropriate and acceptance by Hispanics and dietary guidelines from

the American Diabetes Association (ADA) and the Academy of Nutrition and Dietetics (AND).

Project Objectives:

1) Development of a cookbook that is friendly for people with diabetes and culturally appropriate using common traditional Hispanic ingredients and cooking techniques that are already familiar to the target population. The recipes will be based on the traditional Mexican cuisine with substitutions and modifications made using healthier ingredients and techniques from the original recipes.

2) These traditional recipes will be modified to be lower in fat- and simple sugars with limited carbohydrate contents to control intakes of calories and carbohydrates.

3) Provide a diabetic exchange and nutrient analysis for each recipe in the cookbook to educate and empower the user to enjoy their traditional dishes.

Significance to Public Health

Diabetes can affect many parts of the body and is associated with serious health issues, such as heart disease, stroke, blindness, kidney failure, and amputation, among other disease conditions (National Diabetes Report 2022).

This study is significant to public health due to the fact that Hispanic have higher rates of diabetes and diabetes related complications than non-Hispanic whites. Over the course of their lifetime, adults living in the United States have a 40% chance of developing type 2 diabetes. However, for a Hispanic adult, their chance of developing type 2 diabetes is more than 50%, and they are more likely

to develop diabetes at a younger age (Kirk, et al…2018). Hispanic people may also have higher rates of kidney failure and blindness caused by diabetes (Center for Disease Control and Prevention CDC). Additionally, according to a meta-analysis study conducted by Kirk, et al (2018) the Hgb A1C was approximately 0.5% higher in Hispanics adults with diabetes than in non-Hispanic white adults, which indicates higher blood glucose concentrations over the past three months. Understanding the reasons for these inequalities should be the focal point for future research.

The importance of this study is to develop a cookbook which can be used to meet nutrition needs for people with diabetes and to better understand the food preference among Hispanics with diabetes. Further research needs to be conducted on Hispanics with diabetes to fully understand their cultural food preference and adherence to the meals based on the Diabetes Exchange System.

CHAPTER TWO

LITERATURE REVIEW

A meta-analysis conducted by Kirk, et al (2018) to estimate the difference in Hgb A1C in Hispanics with diabetes and non-Hispanic White. From a total of 495 studies they reviewed, 73 research studies contained data on Hgb A1C for Hispanics and non-Hispanic whites, and 11 research studies met their inclusion criteria. The study showed a statistically significant ($p < 0.0001$) correlation of 0.5% higher Hgb A1C level for Hispanics than in non-Hispanic whites. Therefore, results from their study confirmed that Hispanics are more susceptible to a higher blood glucose and Hgb A1C compared to non-Hispanic whites. Additionally, Hispanics are at a higher risk of developing diabetes and are more susceptible to develop the disease at a younger age due to poor eating habits and lifestyle. Further research needs to be conducted in the Hispanic populations to confirm these findings.

A study by Saeedi, et al (2020) was conducted to estimate the number of deaths due to diabetes in 20 to 79-year-old adults in 2019. They used the data from the World Health Organization (WHO) to estimate the number of deaths caused by diabetes. The researchers used mortality statistics and life tables to determine life expectancy to determine the number of deaths year to date from all causes by age and gender. Age and gender estimates of prevalence for diabetes in 2019 and risks of death in people with diabetes were compared to

people without diabetes. The study reported that 4.2 million deaths among 20 to 79-year-old adults are due to diabetes. Diabetes is estimated to be the main cause of death 11.3%, all around the world, ranging from 6.8% in Africa to 16.2% in the Middle East and North Africa. Almost half, 46.2% of the deaths due to diabetes occur in people under the age of 60. Africa has the highest rate 73.1% of deaths attributable to diabetes in people under the age of 60 years old, in contrast Europe has the lowest 31.4%. In general, there are more deaths associated with diabetes in women than men, 2.3 million women compared to 1.9 million in men. People with diabetes die due to diabetes related complications rather than diabetes itself and lack of accessible healthcare to control diabetes. High blood glucose levels has been shown to be associated with about 15% of all deaths due to Cardiovascular Disease, kidney disease, and diabetes, confirming that a large number of these deaths can be potentially prevented through prevention or early screenings of type 2 diabetes and improved care of all forms of diabetes and their complications. Additionally, 3.4 million deaths in middle income countries can be attributed to diabetes. Diabetes contribute to one in nine deaths among adults aged 20 to 79 years (Saeedi, et al…2020). Prevention of diabetes and its disease complications is crucial, especially in middle income countries like the United States, where the current impact of diabetes is estimated to be at its peak. Further studies need to be conducted in diverse populations to validate these current statistics in people of color.

In the study by Clausen, et al (2018) they studied the effects of intrauterine hyperglycemia and the future risk of developing type 2 Diabetes in their children. They studied the glucose tolerance test in adult children of women with either gestational diabetes (GDM) or type 1 diabetes (T1D). They wanted to investigate whether intrauterine hyperglycemia would lead to a genetic predisposition to type 2 diabetes. The process used by the researcher was to measure the blood glucose at a 2-hour oral glucose tolerance test (OGTT) using a dose of 75-gram of oral glucose. The data were collected from 597 subjects, aged 18–27 years old. In the study the subjects were divided into four groups according to the maternal fasting glucose concentrations during pregnancy and genetic predisposition to type 2 diabetes. The first Group was children of women undergoing dietary treatment to control the GDM. The second group was children of genetically predisposed women with a normal OGTT. The third group was children of women with type 1 diabetes. The fourth group was children of women from the control population; this group was noted as having a relatively low genetic risk of developing type 2 diabetes. The results showed that the prevalence of type 2 diabetes and prediabetes in the four groups was 21%, 12%, 11%, and 4%, respectively. Using the multiple logistic regression analysis, the adjusted odds ratios for type 2 diabetes and prediabetes were 7.76 (95% CI 2.58 -- 23.39) in GDM and 4.02 (1.31 -- 12.33) in children with type 1 diabetes compared with 1.74 (0.89–3.40) in children of women from the control population. In the group with type1 diabetes, the risk of type 2 diabetes and pre-diabetes was

significantly associated with elevated maternal blood glucose in late pregnancy or 1.41 (1.04 -- 1.91) per mmol/l. In conclusion, hyperglycemia and intrauterine GDM are associated with type 2 diabetes and prediabetes in adult children of women with either diet-treated GDM or type 1 diabetes during pregnancy (Clausen, et al...2018). Further research needs to be conducted to confirm these findings.

A study by Forte, et al (2021) was conducted to acknowledge diabetes nurses opinions and the impact that the COVID-19 pandemic had on people with diabetes and the services provided to them in European countries. Nurses who cared for people with diabetes reported an increase in the physical risks of people with diabetes, including hyperglycemia, hospital admissions, foot complications, and also psychological health risks of people with diabetes, such as depression and anxiety (Forte, et al...2021). The study was completed through an online survey using a rapid Delphi method. The survey was translated into 17 different languages and distributed electronically in 27 countries via national diabetes nurse networks (Forte, et al...2021). The Survey responses from 1,829 diabetes nurses were included. The results indicated that 28% and 48% of diabetes nurses felt that the COVID-19 pandemic had a huge impact on the physical and psychological risks of people with diabetes. Many clinical problems increased significantly, such as anxiety 82%, diabetes distress 65%, depression 49%, acute hyperglycemia 39% and foot complications 18%. Additionally, 47% of respondents identified that the level of care provided to people with diabetes had

declined during the COVID-19 pandemic (Forte, et al...2021). Also during the pandemic, 31% of nurses reported that diabetes education and psychological support declined extremely or quite severely. The results showed that diabetes nurses have seen significant increases in both physical and psychological problems in their patients with diabetes during COVID-19 pandemic. The results also show that clinical diabetes services have declined due to COVID-19 pandemic (Forte, et al...2021). Moreover, there is a need to provide additional patient care to lower the impact of the pandemic on the diabetes population.

There are great variations in the care for the individuals with diabetes across the globe. However, it is important for patients with diabetes to have the abilities to empower themselves to self-care through nutrition education and meal preparation may help to improve blood glucose control and improvement in quality of life. Therefore, the development of a Hispanic cookbook for people with diabetes is one of the tools that may empower them to prepare meals that satisfy their taste for traditional food and meet the dietary guidelines as recommended by the American Diabetes Association and the Academy of Nutrition and Dietetics.

CHAPTER THREE

METHODS

Study Design

This project was designed to develop a cookbook that is Diabetic friendly and culturally appropriate using common traditional Hispanic ingredients and cooking techniques that is already familiar to most people in the population. The recipes use traditional Mexican ingredients with substitutions made to meet the guidelines provided by health care professionals. The recipes that were included in the cookbook are traditional dishes that are typically high in carbohydrate, fat and energy contents. These traditional recipes were modified to be diabetic friendly and low in fat, simple sugars and limit carbohydrate contents to control intake of calories and carbohydrates. Additionally, a diabetic exchange for each recipe was provided in the diabetic cookbook.

The original plan of the project development was to distribute the cookbook to ten participants in order for them to test the recipes. However, due to time constraints, this step was not included in the project. Instead the research tested all the recipes for the ease of use and taste acceptability. Modifications were made to the recipes when adjustments were needed.

Data Source and Collection

Traditional Hispanic recipes used in the cookbook were secured using a google search on the world wide web. Traditional Hispanic recipes were then modified to meet nutritional needs for people with diabetes. These recipes were very similar to traditional Mexican cuisine for taste, texture, and appearance, except healthier ingredients and cooking techniques were modified from the original recipes.

Data Analysis

Nutritional analysis was conducted on all recipes using Cronometer software (https://cronometer.com/). Complete nutrient summary was completed but only data for energy (calories), protein (g), carbohydrates (g), and fat (g) were included in the cookbook. Additionally, carbohydrate exchanges for each recipe was added to the cookbook to allow for portion control. The nutrient analyses for the original and modified recipes were compared to show the reduction in the macronutrients and energy contents.

Ethics

Data collected was used only for the purposes of the Masters-level Research Thesis/Project. The information gathered will be accessible only by the researchers and it will be kept in a locked facility on campus. All information from this study will be destroyed at the end of the study and the cookbook may be

published. Due to the nature of the study, IRB approval was not required but an exemption was approved.

This study has been approved by the California State University, San Bernardino Institutional Review Board IRB NUMBER: IRB-FY2024-245

CHAPTER FOUR

RESULTS

Nutrient analysis was conducted using Cronometer software. Nutrient contents were compared between traditional and modified recipes (Table1). Results showed that the modified recipes meet nutritional goals for people with diabetes, while the dishes maintain the traditional taste, texture, and appearance.

Table 1. Nutrient Analysis Comparison of Original and Modified Recipes

	Recipes	Calories	Protein	Net carbs	Fat	CHO exchange
Traditional	Green chicken enchiladas	727	38.3g	49.8g	41.9g	3
Modified	**Green chicken enchiladas**	**532 (-26.8%)**	**35.6g (-7.0%)**	**33.2g (-33.3%)**	**29.1g (-30.5%)**	**2 (-33%)**
Traditional	Enchiladas Suizas	773	48.8g	42.7g	42.9g	3
Modified	**Enchiladas Suizas**	**418 (-45.9%)**	**33.6g (-31%)**	**30g (-29.7%)**	**19.4g (-54.7%)**	**2 (-33%)**
Traditional	Red posole	526	39.4g	50.9g	17.4g	3
Modified	**Red posole**	**227 (-56.8%)**	**35g (-11.1%)**	**17.7g (-65.2%)**	**7.3g (-58%)**	**1 (-66%)**
Traditional	Picadillo	547	35.9g	28.4g	32.4g	2
Modified	**Picadillo**	**373 (-31.8%)**	**32.7g (-8.9%)**	**15.4g (-45.7)**	**20.5g (-36.7)**	**1 (-50%)**
Traditional	Caldo de pollo	549	55.5g	52.2g	**14.8**g	4
Modified	**Caldo de pollo**	**465 (-15.3%)**	**54.6g (-1.6%)**	**31.7g (-39.2)**	**13.8g (-6.7%))**	**2 (-50%)**
Traditional	Green Chicken	534	36.7g	31g	29.5	2

	enchilada casserole					
Modified	**Green Chicken cauliflower enchilada casserole**	**327 (-38.7%)**	**28g (-23.7%**	**14g (-54.8%)**	**18.1g (-38.6%)**	**1 (-50%)**
Traditional	Taquitos	654	30.9g	31.6g	47.2g	2
Modified	**Taquitos**	**425 (-35%)**	**28.5g (-7.7%)**	**31.1g (-1.5%)**	**21.9g (-53.6%)**	**2 (0%)**
Traditional	Steak fajitas	594	44g	57.2g	22.3g	4
Modified	**Steak fajitas**	**415 (-30%)**	**42.7g (-2.9%)**	**33.7g (-41%)**	**19.3g (-13.4%**	**2 (-50%)**
Traditional	Shrimp fajitas	607	37.1g	60.8g	26.0g	4
Modified	**Shrimp fajitas**	**376 (-38%)**	**36g (-2.9%)**	**34.1g (-43.9%)**	**17.9g (-31.1%)**	**2 (-50%)**
Traditional	Black beans	587	38.5g	46.6g	27.5g	3
Modified	**Black beans**	**154 (-73.7%)**	**10.3g (-73.2%)**	**27.8g (-40.3%)**	**.6g (-97.8%)**	**2 (-33%)**

The original green chicken enchiladas recipe had 727 calories, 38.3g protein, 49.8g carbohydrates, 41.9g fat, and carbohydrate exchange 2, compared to modified recipe, which had 532 calories, 35.6g protein, 33.2g carbohydrates, 29.1g fat and carbohydrate exchange 2. The modification led to 26.8% in energy, 7.0% in protein, 33.3% in carbohydrates, 30.5% in fat, with 33% change in the number of carbohydrate exchanges.

The original enchiladas suizas recipe had 773 calories, 48.8g protein, 42.7g carbohydrates, 42.9g fat, and carbohydrate exchange 3, compared to modified recipe, which had 418 calories, 33.6g protein, 30g carbohydrates, 19.4g fat and carbohydrate exchange 2. The modification led to 45.9% in energy, 31% in protein, 29.7% in carbohydrates, 54.7% in fat, with 33% change in the number of carbohydrate exchanges.

The original red posole recipe had 526 calories, 39.4g protein, 50.9g carbohydrates, 17.4g fat, and carbohydrate exchange 3, compared to modified recipe, which had 227 calories, 35g protein, 17.7g carbohydrates, 7.3g fat, and carbohydrate exchange 1. The modification led to 56% in energy, 11.1% in protein, 65.2% in carbohydrates, 58% in fat, with 66% change in the number of carbohydrate exchanges.

The original picadillo recipe had 547 calories, 35.9g protein, 28.4g carbohydrates, 32.4g fat, and carbohydrate exchange 2, compared to modified recipe, which had 373 calories, 32.7g protein, 15.4g carbohydrates, 20.5g fat, and carbohydrate exchange 1. The modification led to 31.8% in energy, 8.9% in protein, 45.7% in carbohydrates, 36.7% in fat, with 50% change in the number of carbohydrate exchanges.

The original caldo de pollo recipe had 549 calories, 55.5g protein, 52.2g carbohydrates, 12.8g fat, and carbohydrate exchange 4, compared to modified recipe, which had 465 calories, 54.6g protein, 31.7g carbohydrates, 13.8g fat, and carbohydrate exchange 2. The modification led to 15.3% in energy, 1.6% in

protein, 392% in carbohydrates, 6.7% in fat, with 50% change in the number of carbohydrate exchanges.

The original green chicken enchilada casserole recipe had 534 calories, 36.7g protein, 31g carbohydrates, 29.5g fat, and carbohydrate exchange 2, compared to Green chicken cauliflower enchilada casserole modified recipe had 327 calories, 28g protein, 14g carbohydrates, 18.1g fat, and carbohydrate exchange 1. The modification led to 38.7% in energy, 23.7% in protein, 54.8% in carbohydrates, 38.6% in fat, with 50% change in the number of carbohydrate exchanges.

The original taquitos recipe had 654 calories, 30.9g protein, 31.6g carbohydrates, 47.2g fat, and carbohydrate exchange 2, compared to modified recipe had 425 calories, 28.5g protein, 31.1g carbohydrates, 21.9g fat, and carbohydrate exchange 2. The modification led to 35% in energy, 7.7% in protein, 1.5% in carbohydrates, 53.6% in fat, with no change in the number of carbohydrate exchanges. The modified recipe meets diabetic guidelines. However, the modified recipe for taquitos did not lower carbohydrates, modified recipe did lower calories and fat content significantly due to no added oil or fat.

The original steak fajitas recipe had 594 calories, 44g protein, 57.2g carbohydrates, 22.3g fat, and carbohydrate exchange 4, compared to modified recipe, which had 415 calories, 42.7g protein, 33.7g carbohydrates, 19.3g fat, and carbohydrate exchange 2. The modification led to 30% in energy, 2.9% in

protein, 41% in carbohydrates, 13.4% in fat, with 50% change in the number of carbohydrate exchanges.

The original shrimp fajitas recipe had 607 calories, 37.1g protein, 60.8g carbohydrates, 26g fat, and carbohydrate exchange 4, compared to modified recipe, which had 376 calories, 36g protein, 34.1g carbohydrates, 17.9g fat, and carbohydrate exchange 2. The modification led to 38% in energy, 2.9% in protein, 43.9% in carbohydrates, 31.1% in fat, with 50% change in the number of carbohydrate exchanges.

The original black beans and pork recipe had 587 calories, 38.5g protein, 46.6g carbohydrates, 27.5g fat, and carbohydrate exchange 3, compared to Black beans vegetarian modified recipe had 154 calories, 10.3g protein, 27.8g carbohydrates, .6g fat, and carbohydrate exchange 2. The modification led to 72.7% in energy, 73.2% in protein, 40.3% in carbohydrates, 97.8% in fat, with 33% change in the number of carbohydrate exchanges. The modified recipe meets diabetic guidelines and significantly lowered fat and energy content.

Therefore, the modified recipes in the Hispanic cookbook for Individuals with diabetes successfully met the guidelines established by the American Diabetes Association (ADA) and the Academy of Nutrition and Dietetics (AND).

CHAPTER FIVE

DISCUSSION

The overall purpose of this study was to develop a cookbook that could positively influence eating habits for Hispanics with diabetes while preserving the traditional taste, texture and appearance. The project successfully met this purpose by providing recipes that meet the dietary guidelines established by the American Diabetes Association and the Academy of Nutrition and Dietetics. Nutrient analyses of the recipes were completed using the free version of web-based Cronometer software and the macronutrients, energy contents, and the number of carbohydrate exchanges were included in the cookbook. This cookbook may positively influence eating habits for the Hispanic diabetic community.

Strengths and Limitations

Strengths: The cookbook will allow people with diabetes to adhere to the standards of the diabetes exchange list while meeting the food preferences and their nutritional goals. This project will provide a better understanding of culturally appropriate recipes that people with diabetes may choose to eat.

Limitations: The number of modified recipes was restricted to 28 to contain the cost of the project. Also due to time limitations, the actual testing of the recipes by participants was not completed. However, the recipes were tested by the researchers for acceptability and clarity in the directions provided. The

database used to complete the nutrient analysis was free and would have been more appropriate to use the database that is more comprehensive in the ingredients. Substitutions for ingredients may have affected the nutrient contents of the dishes.

Reliability and validity: Reliability of the nutrient analysis using the free version of Cronometer software is challenging because the software has an incomplete database of ingredients in the application. It would have been better to use a nutrient analysis software with a more comprehensive database. However, the validity of this research project was appropriate for the project, due to the steps, processes, and data collected, and the study met its objectives.

Recommendations for Future Research and Practice

Future studies should consider including a qualitative component where the recipes can be tested by 10 or more participants, who can be categorized under one of the three level of diagnosis, Diabetes (T1D, T2D), or Pre-Diabetic (Metabolic disease), or recipe tester who have a family member with type 2 Diabetes mellitus, and the tester who identified as of Hispanic descent. The recipes may be tested by others for ease of use, clarity in directions, and overall acceptability of the dish. The data can then be used to further modify the cookbook as needed. Moreover, the evaluation of the recipes and dishes using qualitative and quantitative can show the effectiveness of the cookbook to the Hispanic community. Additionally, future research should investigate whether this

and other cookbooks for Hispanics with diabetes may determine positive eating habits in this population.

Conclusion

This project for completion of the master's degree was designed to create a diabetic cookbook for the Hispanic community. The project was completed to empower people with diabetes to prepare recipes that meet their desire to eat traditional dishes that are healthy. The project successfully met the objectives established by the researchers.

APPENDIX A

HISPANIC COOKBOOK FOR INDIVIDUALS WITH DIABETES

(SEE COOKBOOK IN ATACHED FILE)

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Recipe sources:

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