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## Decreasing the Impact of Diabetes in the Adult and Older Adults Rural Health Population Utilizing Phone Calls as Part of the Chronic Care Management Program

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DECREASING THE IMPACT OF DIABETES IN THE ADULT AND OLDER  
ADULTS RURAL HEALTH POPULATION UTILIZING PHONE CALLS AS PART  
OF THE CHRONIC CARE MANAGEMENT PROGRAM

A DNP Project Submitted to the  
Graduate Faculty  
of Jacksonville State University  
in partial Fulfillment of the  
Requirements for the Degree of  
Doctor of Nursing Practice

By

ADRIENNE SLAUGHTER SHAMBRAY

Jacksonville, Alabama

June 28, 2021

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June 28, 2021

## ABSTRACT

This quantitative study was developed in order to evaluate the impact of phone calls on patient outcomes using the Chronic Care Management program (CCM). In January 2015, the Centers for Medicare and Medicaid Services (CMS) implemented the (CCM), with the goal of improving health and quality of care for high-risk patients. The administration and physicians at the clinic of focus for this project recognized a need for the facility to help improve and manage these patients' care to prevent issues such as hospital readmission. This project aimed at following patients in the program with the chronic condition of diabetes mellitus and tracked previous glycated hemoglobin (A1C) prior to program and compared the result to the A1C three months into the program. After participation in the program for a minimum of three months, a quantitative analysis was completed from the data collected. Results showed the probability of an individual's A1C to decrease was 61.8%, which is clinically significant. Nursing has a strong foundation based in promoting quality of life for patients. This project reflects that goal and has potential to advance nursing's mission to promote quality of life moving into the future.

Keywords: Chronic care management, Chronic care protocols, Chronic care, diabetes, Type 2 diabetes, diabetes management, telehealth

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## TABLE OF CONTENTS

|   |    |
|---|----|
| Abstract.....   | iv |
| Introduction.....   | 1  |
| Background.....   | 1  |
| Problem Statement.....                                      | 3  |
| Organizational Description of Project Site.....             | 4  |
| Review of Literature.....                                   | 4  |
| Evidence-Based Practice: Verification of Chosen Option..... | 8  |
| Theoretical Framework.....                                  | 9  |
| Goals, Objectives, & Expected Outcomes.....                 | 11 |
| Project Design.....   | 12 |
| Project Site and Population.....                            | 13 |
| Setting Facilitators and Barriers.....                      | 14 |
| Implementation Plan/Procedures.....                         | 15 |
| Measurement Instruments.....                                | 15 |
| Data Collection Procedure.....                              | 15 |
| Data Analysis.....  | 16 |
| Results.....  | 19 |
| Interpretation/discussion.....                              | 20 |
| Cost-Benefit Analysis/Budget.....                           | 22 |
| Timeline.....   | 22 |
| Ethical Considerations/Protection of Human Subjects .....   | 23 |
| Conclusion.....   | 23 |
| References.....   | 25 |

|                 |    |
|-----------------|----|
| Appendices..... | 29 |
| Appendix A..... | 29 |
| Appendix B..... | 30 |
| Appendix C..... | 31 |
| Appendix D..... | 34 |

# Decreasing the Impact of Diabetes in the Adult and Older Adults Rural Health Population Utilizing Phone Calls as Part of the Chronic Care Management Program

## **Introduction**

The older adult population is continuing to grow and will soon triple in the next few decades to come. Based on current trends, the population of people greater than 79 years of age will expand from approximately 126.5 million to approximately 446.6 million by 2050. When aging, the population tends to accumulate multiple deficits in their life that makes them more vulnerable and require more assistance in healthcare. It is predicted that the growing population will see a decline in daily functions, have unfavorable health outcomes, and have frequent hospital admissions (Aranha, Smitherman, Patel, & Patel, 2020). Hospital admissions are costly and can cost insurance companies and patients millions to billions of dollars yearly. With proper quality of care, hospital admissions and readmissions can be reduced and occasionally prevented (Chen & Grabowski, 2019).

## **Background**

Healthcare providers have a responsibility of providing quality care to patients and preventing hospital admissions and readmissions. Hospitalizations are a burden on healthcare systems and individuals financially and physically. This may cause depression, poor social support, and/or polypharmacy for patients; therefore, linking to patients getting readmitted to the hospital. Another factor of hospital readmission is poor discharge planning processes where hospital staff may fail to have adequate

communication with primary care physicians or patients fail to utilize follow-up visits (Shih, Buurman, Tynan-McKiernan, Tinetti, & Jenq, 2015). Adequate follow-up with patients who have been hospitalized is lacking in primary care.

This lack of follow-up care can be costly. Readmissions among Medicare beneficiaries account for 56% of three0-day readmissions in the United States and cost \$26 billion (Jung, DuGoff, Smith, Palta, Gilmore-Bykovskyi, & Mullahy, 2020). Approximately, one-quarter of patients develop an adverse effect and half of those events are preventable. It was estimated about 19.6% of Medicare fee-for-service patients are re-hospitalized within 30 days of discharge. This accumulates extreme costs; for example, 3.3 million adults were readmitted to the hospital within three0 days and resulted in a cost of \$41.3 billion. Each year, avoidable hospital readmissions cost approximately \$12 billion (Hudali, Robinson, & Bhattarai, 2017). These statistics prove the need for interventions to reduce hospital admissions and subsequent costs.

According to Scott (2018), one intervention to reduce these statistics is the implementation of the Chronic Care Management (CCM) program. CCM services are provided by a physician or non-physician practitioner such as a nurse practitioner or physician assistant. The service is provided per calendar month for patients with multiple chronic conditions. The conditions must meet the expected criteria lasting at least a year, placing the patient at risk of death, acute exacerbation, or functional decline. The chronic condition may include Alzheimer's disease, arthritis, asthma, cancer, chronic obstructive pulmonary disease, diabetes, heart failure, hypertension, heart disease, or depression (Scott, 2018). This study will focus on patients with diabetes in the CCM program.

Diabetes mellitus is associated with a two to three-fold increase in the likelihood of contracting cardiovascular diseases. Managing diabetes appropriately and lowering the glycated hemoglobin (HbA1C) by at least 1% reduces microvascular complications (Gorina, Limonero, & Alvarez, 2018). The use of an interdisciplinary care team for diabetes care when combined with self-management diabetic education and glucose-lowering therapies helps prevent comprehensive lifelong complications. The CCM program allows a team effort between staff and patients to develop goals for the patient's health and manage individual goals that have been set (Del Valle & McDonnell, 2018). With proper education, patients feel better by increasing their knowledge and experience and they are protected from possible side effects by controlling the disease. Telephone reminders are effective in creating behavior change in patients with diabetes in performing self-management activities (Eroglu & Sabuncu, 2021).

### **Problem Statement**

The adult and older adult population with multiple chronic conditions need adequate quality of care and follow-up to ensure proper compliance and treatment. The patient, intervention, comparison, and outcome (PICO) question for this DNP project is as follows: among the insured adult to older adult patients ages 25 and older, how effective are monthly telephone calls as part of the CCM program in ensuring adequate A1C control, compared to patients' A1C prior to entering the program? The author will address the PICO question by utilizing monthly phone calls to evaluate a newly implemented program within a primary care clinic.

## **Organizational Description of Project Site**

The population with diabetes continues to rise and is partially due to the lack of education, patient self-management, and/or patient understanding of the disease. The help of education and continued follow-up causes an increase in patient's managing their care and achieving the goals created for his/her treatment. The project site needed a protocol to assure providers and staff had the ability to assure proper diabetic education and counseling as well as giving the patient more access to express one's needs, concerns, questions, and understanding (Eroglu & Sabuncu, 2021). According to Eroglu & Sabuncu (2021), studies show there is a direct link between education and metabolic control.

## **Review of Literature**

According to Westphal (2019), healthcare and medicine have made great advances over the decades and have resulted in longevity in human life. This results in humans living longer with chronic conditions such as heart disease, chronic obstructive pulmonary disease (COPD), Alzheimer's disease, stroke, cancer, and diabetes. These conditions account for two-thirds of deaths and \$1.5 trillion of healthcare spending (Westphal, 2019). According to Cohen et al. (2020), the United States and other developed nations enjoyed large gains in life expectancy at birth, however, the United States began to lag behind other nations starting in the 1960s. This poor performance has been studied and documented to find the proper solution to enhance care. Studies have shown that patients with insurance versus patients without insurance have improved

survival and achieved better outcomes due to access to earlier diagnoses and treatment, especially individuals with diabetes (Cohen et al., 2020).

According to the Centers for Disease Control and Prevention (CDC) (2021), diabetes is the seventh leading cause of death in the United States. Approximately 4.2 million adults in the US have diabetes, and 20% of those people are unaware they have the diagnosis. In the last twenty years, adults diagnosed with diabetes have more than doubled (CDC, 2021). Rodriguez et al., (2021) stated providers should follow recommendations by the American Diabetes Association (ADA) and screen individuals aged 45-70 years of age who are overweight/obese, individuals with a family history of diabetes, and individuals with a history of gestational diabetes or polycystic ovarian syndrome. According to the ADA (2021), if individuals present to the clinical setting complaining of polyuria, polydipsia, polyphagia, fatigue, blurry vision, slow healing wounds, weight loss, or paresthesia; the provider should screen the individual for diabetes. Early detection of diabetes can decrease the risk of developing diabetic complications (ADA, 2021).

Hospital readmissions have been on the rise for decades due to chronic diseases, which are one of the most significant challenges the United States healthcare system confronts. The majority of Medicare beneficiaries have two or more chronic health conditions. These beneficiaries have more hospitalizations, physician visits, and emergency room visits when compared to patients with one or no chronic conditions. Primary care practices provide the majority of the beneficiaries' care; although, these practices often receive inadequate funding and infrastructure support. In January 2015, the Centers for Medicare and Medicaid Services (CMS) implemented a new policy to pay

providers or chronic care management services. The goal was to improve health and quality of care for high-need patients. This program allowed eligible providers to bill CMS for up to 20 min of non-face-to-face care services in a three0-day period (Wilson, O'Malley, Bozzolo, McCall, & Ma, 2019).

As stated above, one study estimated that approximately 19.6% of Medicare patients are hospitalized within thirty days of hospital discharge (Hudali, Robinson, & Bhattari, 2017). Rehospitalizations also caused an increase in costs in the hospital setting. In 2011, approximately 3.3 million adults were readmitted to the hospital which cost about \$41.3 billion (Hudali, Robinson, & Bhattari, 2017). By 2016, the three0-day readmission rate had increased to over 4 million (Bailey, Weiss, Barrett, & Jiang, 2019). The goal of researchers, hospitals, and policymakers is to reduce preventable patient readmissions. Billions of dollars are wasted each year due to avoidable hospital readmission costs. When attempting to reduce readmission rates, the readmission of high-risk patients was significantly reduced with adequate one-week follow-up appointments after discharge. Patients who do not receive timely follow-up appointments with their primary care provider have readmission rates ten times higher than those who do. This article presented a study that followed a transition of care clinic after discharge. The study focused on the care for patients in a 30-day window and with the policy and procedure of follow-up care, the clinic succeeded in reducing the rehospitalization rate from 11.7% to 3.8%. One method used to help reduce rehospitalization was through enhancing communication with patients after discharge. This includes post-discharge phone calls along with community-based education and information through easily

accessible electronic health records among inpatient and outpatient providers (Hudali, Robinson, & Bhattari, 2017)

Xing, Goehring, & Mancuso (2015) study demonstrated that having well-designed care coordination after discharge can reduce healthcare costs and manage chronic conditions. Care coordination improves communication among patients and healthcare providers. This study also showed high-risk patients who benefitted from care coordination by having a Chronic Care Management program. In this program, a nurse care manager coordinated the long-term care services, educated patients to better understand signs of worsening health, and supported patients' efforts to achieve self-management goals (Xing, Goehring, & Mancuso, 2015). The program included an initial comprehensive assessment, an individualized health action plan, and meetings with the nurse care manager occurring at least once a month. Health action plans were reviewed and updated every six weeks (Xing, Goehring, & Mancuso, 2015).

Implementing this program can be difficult for clinical practices due to a lack of infrastructure. The Chronic Care Management (CCM) program was developed by The Centers for Medicare and Medicaid Services (CMS). It was developed to provide care coordination activities outside of office visits. A 2015 article by Hodach, addressed the challenges of the CCM program. One challenge is finding ways to promote greater patient engagement with the comprehensive care plans required by CMS. Without the care plan in place, there is a risk for a negative impact on the success of the patient's condition. Another challenge was reconfiguring and adapting electronic health records to be more aligned with CCM. The support of Healthcare Information Technology (IT) can help ease these challenges (Hodach, 2015).

After literature review, the evidence reveals the continued rise of hospitalizations due to worsening of an individual's chronic conditions (Aranha, Smitherman, Patel, & Patel, 2020; Bailey, Weiss, Barrett, & Jiang, 2019). This has caused a strain for patients physically, emotionally, and financially. Insurance companies have more responsibilities to manage financially as well. One study found that patients were not receiving the education needed at hospital discharge which resulted in a decrease in patients' abilities to manage their care properly and therefore, returned to the hospital within the 30-day window (Bailey, Weiss, Barrett, & Jiang, 2019). Another study found that a nurse who took time to educate a patient and his/her family, establish a care plan, and meet with the patient often significantly decreased the likelihood of rehospitalization. Barriers to this type of program exist, such as patient and staff participation. Therefore, proactive measures may be needed to mediate these barriers (Chen & Grabowski, 2019).

The CCM program was implemented to help decrease hospitalizations, however, research shows a lack of information regarding specific chronic conditions such as diabetes. Because the system is newly introduced, there is a lack of evidence regarding its impact on diabetic complications and management. More evidence is also needed regarding the impact of providers counseling patients regularly and the impact on meeting diabetic goals.

### **Evidence-Based Practice: Verification of Chosen Option**

After a thorough literature review, the program intervention chosen for implementation focused on patients with diabetes to improve their A1C by adjusting the CCM program that was established at the rural primary clinic chosen for this study. This

intervention focused solely on patients with diabetes with a goal to reduce diabetic complications; therefore, reducing diabetic-related hospitalizations. The intervention included close follow-up with these patients through phone calls regarding their self-management. The phone calls included the needed education and counseling to impact the desired goals.

### **Theoretical Framework**

This DNP project is based on two theories. One is the interpersonal relations in nursing theory by Hildegard Peplau which focuses on observations. The second theory is Neuman's systems model by Betty Neuman which focuses on examining patients as a system.

Hildegard Peplau developed the theory of interpersonal relations in nursing, in which she discussed her belief nursing concepts should come from observations in nursing. Peplau developed a system combining inductive and deductive reasoning. This was based on observation (inductive) and known concepts (deductive). She used methods to examine phenomena of interest and to test an intervention targeted at the problem (Peplau, 1991). Peplau's interpersonal model examines the process between the nurse and patient that works toward a mutual goal. The DNP project will follow this process when developing goals with the patient at the beginning of the program to help prevent hospitalization or rehospitalization. The first phase of Peplau's theory is orientation, in which the nurse gathers healthcare and other information about the client, and an auto

diagnosis is developed regarding the illness/disorder. A nurse may function as a resource person by giving specific information that aids the patient to understand the situation (Peplau, 1991). In this concept, introductions are made, questions are asked, and issues are clarified. Trust and rapport are developed between provider and patient. This phase also includes contracting, establishing a plan of care, and time limits for visits are clarified and agreed upon (Peplau, 1991). Initially in the program, the provider discusses the program and the chronic conditions with the patient. Then, the patient gives consent to join the CCM program and establish a plan of care. The second core concept of this model is identification. In this step, the nurse and patient clarify expectations and determine how to work together. In this phase, the patient's first impression is clarified; one feels that he/she knows what the situation can offer; and then responds to persons who seem to offer the help one needs (Peplau, 1991). The third phase is exploitation, in which the patient uses the services offered by the nurse and attempts to accept full value from the relationship that has been established (Peplau, 1991). The final core concept is resolution. In this step, the patient's needs have been met and the patient moves toward independence due to the gradual freeing from being a person that needs help to having the strength and ability to stand more or less alone (Peplau, 1991). The patient may reduce interaction times, issues are summarized, and the patient has a health maintenance plan (Peplau, 1991).

Betty Neuman's system model states an individual or group is a client system. Each system is unique but composed of common characteristics. It further states that nursing interventions can affect the client's move toward health on several levels. The

goal is to promote the system's stability by assessing the impact of stressors and helping the client adjust to the environment. Neuman's systems model focuses on three types of prevention: primary, secondary, and tertiary prevention, which promote wellness (Neuman, 1982).

The DNP project used primary prevention by promoting health and wellness to reduce risk factors and prevent possible medical events. Secondary prevention was practiced in the CCM program by helping patients amid chronic conditions when a stressor has occurred. Then tertiary prevention maintained wellness after an event by continuing to monitor patients monthly (Neuman, 1982). In this project, each patient was seen and treated as individuals and not as a generic group of individuals with diabetes, although that was the common characteristic of the project population. Each patient had time to discuss interventions to improve or stabilize their health and work towards a goal. Stressors were also discussed, and the relationship was built between the patient and the provider to assess the stressor and help the patient adjust to his/her environment (Neuman, 1982).

### **Goals, Objectives, and Expected Outcomes**

The purpose of this project was to establish monthly phone calls to follow patients in the program with the chronic condition of diabetes and tracked previous A1C prior to entry compared to A1C three months into the program. Phone calls included a review of daily glucose readings as well as medication reconciliation. This information is verbalized to the provider by the patient or caregiver. This allowed the provider to assess patient/caregiver competency with both glucose monitoring and medication compliance.

The provider adjusted medications as needed and provided patient medication education, also as needed. Data analysis compared A1C prior to entry to A1C three months after phone calls were initiated and measured any differences for statistical significance. In addition, any medication administration errors (e.g. patient reports taking incorrect medication or dosage) from first phone call to last phone call were noted and month one was compared to month three to analyze for statistically significant changes. The expected outcome was to show a decrease in A1C in patients that have an A1C greater than 7% or to stabilize patients who have an A1C less than or equal to 7%.

### **Project Design**

This project was a quantitative, quasi-experimental design and purposive sampling was used in data collection. It focused on implementing a program to help reduce hospitalizations and rehospitalizations in Medicare patients with chronic conditions. Every month a provider contacted the patient for close follow-up on diabetes. If the patient had complications or questions regarding intervention, medication, or diet; the phone calls were more frequent such as weekly or bi-monthly. A detailed protocol was implemented to create a system for consistent care in a rural clinic. The protocol for the project was developed to help staff continue the program for longevity. Post-surveys were completed by patients via telephone on the usefulness of the program. Quantitative data were collected on the percentage of A1Cs and hospitalizations or lack thereof during the program.

## **Project Site and Population**

The project took place at a family practice clinic in an urban area. This community has a small-town feel but is continuing to develop and grow each year. The population is approximately 14,000 as of 2019. Of those residents, 86% are Caucasian and 14% identify as minorities. Approximately 14% lived in poverty (U.S. Census Bureau, 2019). Only two medical clinics reside in this area. The participants of this project included patients with Medicare as their primary insurance and had at least two chronic conditions. They participated by answering the calls every month and communicating with the staff regularly. The provider was responsible for calling the patients for follow-up care. Patients were able to contact our staff if they had any medical questions or problems and the staff were aware of the protocol to help assist with clerical needs or to notify the provider of the patient's concern regarding treatment or his/her condition. Clinical staff for the program included a nurse practitioner who was the main source of communication with the patients. Medical assistants helped manage any incoming calls and direct messages to the nurse practitioner for any patient calls that needed immediate attention and/or had questions outside of the monthly calls. Recruitment for the program included discussing the project with a patient with diabetes during his/her lab visit and obtaining the written consent if the patient wanted to join. When patients decided to join, the next contact via telephone included developing a care plan with the patient.

The practice offers services ranging from newborns to older adults. Service ranges from wellness visits to acute care visits. Procedures performed at the clinic may include suturing, ear irrigation, cryotherapy, joint injections, trigger point injections, incision and drainage, and casting. Each physician has three to four medical assistants, and each nurse practitioner has one to two medical assistants. Communication between the author and staff included messages through the charting system and direct communication.

### **Setting Facilitators and Barriers**

The resources included a guideline from Medicare used when the program was implemented. Office resources included a provider, medical assistants, lab technicians, phones, computers, a charting system, and paper. Constraints included time management of regular clinic visits and managing the program each month. Barriers included patients not answering phone calls or not wanting to participate with the program after a few months of being enrolled in the program. Some patients did not want to spend time on the phone discussing their daily or weekly blood glucose logs. Other patients were not checking their blood glucose level appropriately or found a pattern of knowing when they would receive a phone call and check their blood sugar at that time. Another barrier included lack of proper documentation of staff members if they discussed anything with the patients regarding diabetes. Having bi-monthly meetings with staff helped reiterate the need for proper documentation and prevented any burnout or staff becoming lax to ensure close follow-up, program accuracy and continued care.

## **Implementation Plan/Procedures**

### **Measurement Instruments**

The CCM program was established prior to the implementation of the DNP project but was used as the basis for the patient selection for the project. When measuring the outcomes of this DNP Project the following instruments were used: the patient list, the patient information form was used during each phone call to document data collection and log glucose levels, and the data spreadsheet for results. Approaching the end of the three months, a phone survey was given to evaluate the project. A spreadsheet was created for the A1C data entry.

### **Data Collection Procedures**

Pre-intervention consisted of getting the approval for the project from the Institutional Review Board (IRB) (see Appendix A). The agency was selected for the project and permission was given to allow the investigator to perform the study for the project (See Appendix B). Pre-intervention also consisted of developing the protocol for the continuation of the chronic care program. A list was provided of all Medicare patients in the office from each physician in the clinic and the investigator sorted the patients with diabetes from those patients not diagnosed with diabetes. The patients on

the list were contacted and made aware of the project and provided with needed information for enrolling in the program. They gave verbal consent to enroll in the program and then signed a consent form in the clinic prior to participation (see Appendix C). For the first data collection, the intervention included obtaining the initial A1C of the patient from the initiating month or within three months of the start of the project. Then, each patient was contacted via phone call or in the office to develop a care plan and develop appropriate goals. For three months, the project investigator called the patient every month and occasionally called patients weekly due to medication changes and to discuss any questions the patient had regarding diabetes. A patient information (Appendix D) form was kept for tracking purposes to monitor patient progress from visit to visit. Post-intervention included collecting the second A1C for each patient, evaluating the effectiveness of the program such as evaluating the patient's second A1C and blood sugar logs.

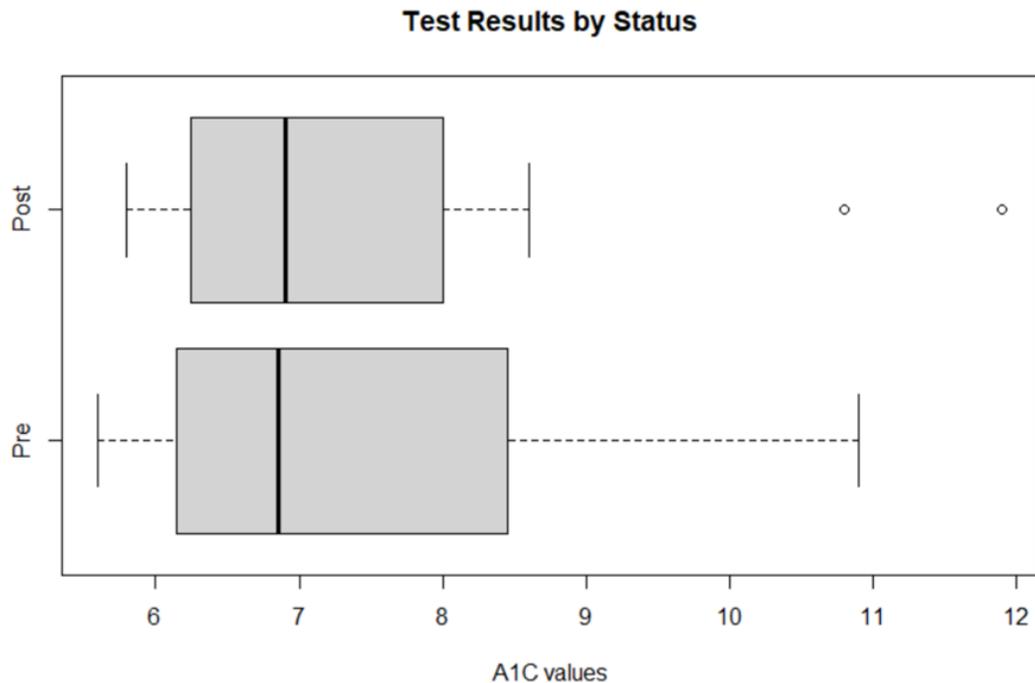
### **Data Analysis**

Twenty participants were selected for the study. The participants were between the ages of 26-8three. The objectives and design have been described in detail elsewhere. Briefly, the study recruited adults with a diagnosis of diabetes from a rural primary clinic in the US. Recruitment began in January of 2021 and participants were followed until April 2021. For data analysis, the participants were divided into four groups by age for comparison. Group 1 consisted of individuals less than 45 years of age, group 2 included ages 46-55 years old, group three included ages 56-65 years, and group 4 included

participants greater than 65 years of age. The pre- and post-A1C was gathered in the lab of the rural clinic by certified lab technicians.

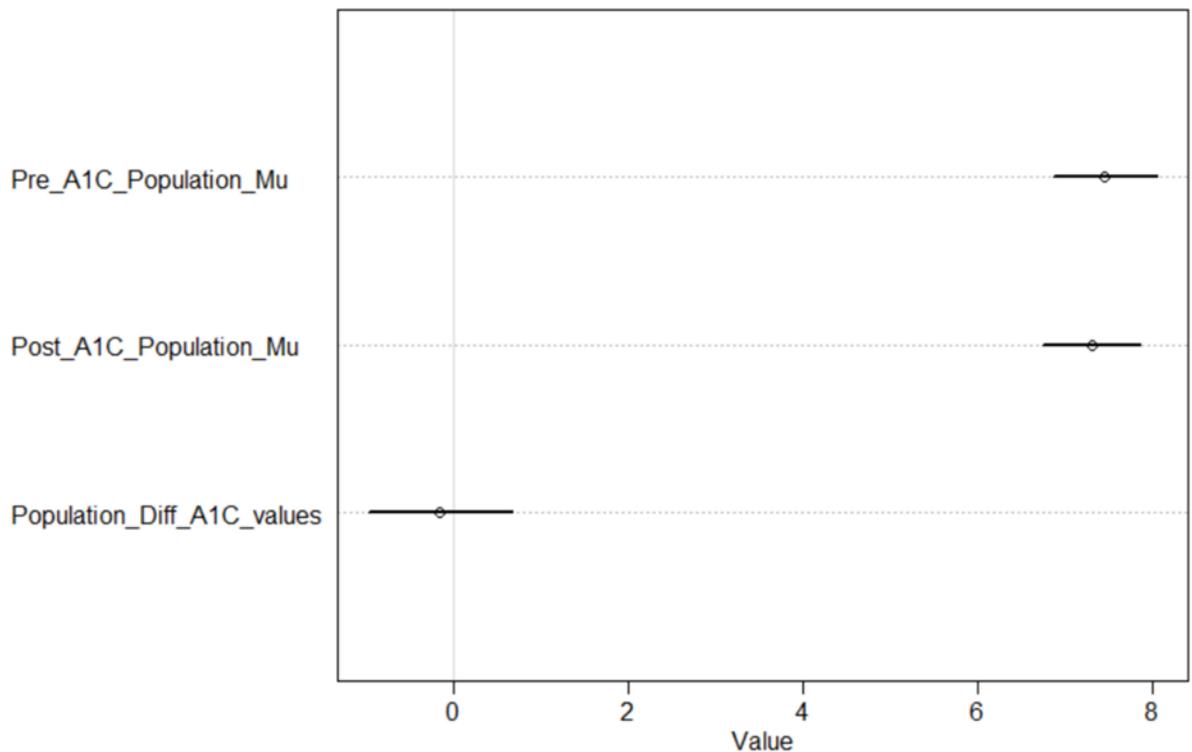
A classical analysis was done on the overall A1C results for paired pre and post-values (see Figure A). This project team selected a one-sample dependent t-test that showed the true mean is not equal to zero and likely is negative. This analysis reveals there is no statistically significant difference in overall HbA1C values by the paired pre and post values ( $t = -0.55267$ ,  $df = 19$ ,  $p\text{-value} = 0.5869$ ,  $CI\ 95\%$ ). According to this analysis, the mean for pre-intervention A1C was less than 7 and the post-intervention mean was averaging 7 (J. Cleveland, personal communication, April 21, 2021).

**Figure A**



A Bayesian Analysis (see Figure B) was run to provide further information about the data. It shows the overall HbA1C to compare the pre- and post-HbA1C mean. It shows there is no statistically significant difference in overall A1C values by paired pre and post results. Since the credible interval includes zero, it could be possible that there was no difference between pre- and post-status results for A1C. However, based on the data, the probability that an individual's HbA1C would decrease is 61.8% (J. Cleveland, personal communication, April 21, 2021).

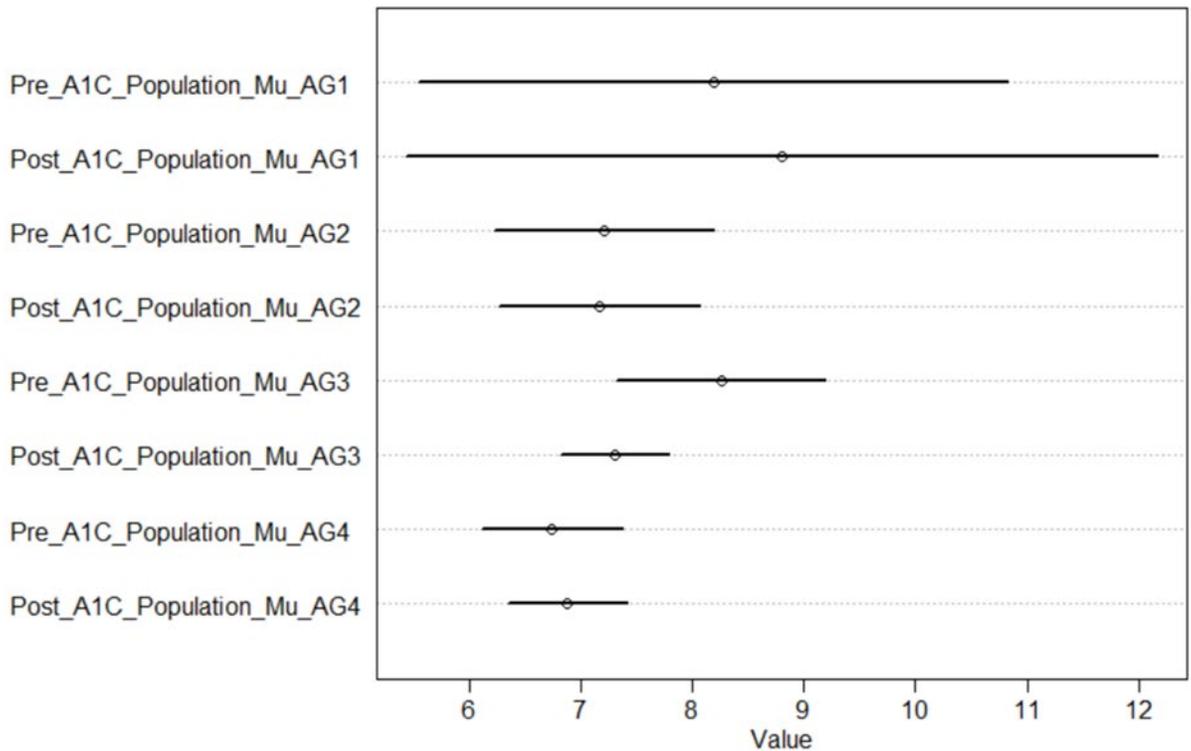
**Figure B**



A Bayesian analysis was also used to reveal the results of each age group mentioned previously (see Figure C). It does present that there is no statistically

significant difference in overall HbA1C values (by paired pre and post and by age range category). Since the confidence interval includes zero, it could be possible that there was no difference between pre and post and age-range status results for HbA1C (J. Cleveland, personal communication, April 21, 2021).

**Figure C**



**Results**

Although each analysis shows no statistically significant difference, the study has practical differences. The breakdown of the groups shows there was a decrease in HbA1C in the group ages 56-65 over a three-month period. The age group of 46-55 remained about the same with an average mean of pre-HbA1C 7.20 and decreased to

HbA1C 7.17 during the three-month period. The other two groups showed a slight increase in the HbA1C over the three-month period. Due to short duration of the study, any decrease in HbA1C was significant. If the study is continued over the duration of a year, the overall probability of potential decrease (61.8%) may increase and show statistical significance (J. Cleveland, personal communication, April 21, 2021).

### **Interpretation/Discussion**

Most society guidelines incorporate recommendations for hemoglobin A1C monitoring and routine primary care visits in an effort to reduce the burden of diabetes complications. In a 2018 national database study, patients who regularly received all the recommended preventative measures, due to close follow-up, experienced a 20% risk reduction in hospitalization (Albright & Fleischer, 2021). The participants in this study state in the post-telephone survey that they did not have any hospitalizations during the duration of this project. The results listed state the overall mean of A1C increased. A few factors impacted this result. Multiple participant's A1Cs remained the same. For example, the pre-A1C was 7.2 and the post-A1C was 7.2. This is still a positive result because the patient followed the protocol of taking medication regularly, continuing a diabetic diet, and participating in monthly phone calls. Patients that showed a slight increase in A1C in Group 1 had trouble accepting every phone call each month due to work, appointments, or life events. Some of these patients did not always have weekly glucose logs to present but would state they checked their glucose regularly. Group 4 included patients that had trouble recalling their diabetic medications and some found out

they were taking their medication incorrectly. When the patient would have an appointment at the doctor's office, they would tell the provider that they were taking the medications on file. For one participant, when asked specifically about each medication on the initial phone call, the patient stated one could not afford the medicine prescribed and was taking an old prescription found in the cabinet. The patient stated fear of disappointing his/her doctor if the truth was told. Education was provided on the harmful effects this could cause and the ways we could improve this situation.

One limitation of this study is the diabetic maturity of the participants. One cannot ascertain that the length of time a participant has been a diabetic affects the attitude towards the project and manner of one's behavior. A participant who has been a diabetic for a decade may be inflexible to change if they present with bad eating habits and not taking their medication and vice versa a participant who has his/her regimen in place with good habits may skew the results to look better. Another limitation is the primary exposures and outcome variables such as blood glucose levels, diet, and medication are self-reported. Self-reporting can be subject to bias among the participants. Lastly, the data analysis was set to zero although the A1C will never be zero. With adjustments, the data could change in the future.

The results help one to see the issues that occur in the primary care setting with patients that do not improve and the reasons for their actions. It is important to see the patients' improvements but it is also important to see the patients whose A1C did not decrease. When reflecting on future recommendations, studies should include a larger sample size in each age group to obtain more data. The data could include race/ethnicity,

financial status, and diabetic maturity (timeline since diagnosed with diabetes). Another recommendation for further studies is a longer duration; the study should continue for at least one year for more accurate data collection since three months is the recommended amount of time to obtain an HbA1C. Future studies should consider including a continuous glucose monitor to obtain more accurate readings from patients.

### **Cost-Benefit Analysis/Budget**

No financial cost was obtained by the office for the project, but time was utilized from providers and medical staff. If patients are in the CCM program, they were already aware that their insurance is billed and there was a possibility of obtaining a bill that the patient will bear if extra services were provided. Patients did not report any additional fees incurred. This study did not charge any extra finances for the participants. Obtaining cost or the lack thereof does not affect or benefit this project to monitor their diabetes.

### **Timeline**

The project was originally developed beginning in the summer of 2020 and implementation began the fall of 2020. Data collection lasted from January 2021 to April 2021, and the analysis was completed in April 2021. When considering the timeline from start to finish, the project lasted 10 months.

## **Ethical Considerations/Protection of Human Subjects**

The Jacksonville State University Institutional Review Board (IRB) approval (Appendix A) was obtained before initiating the DNP project. All participants were protected by the Health Insurance Portability and Accountability Act of 1996 (HIPAA). All patients were coded to protect privacy and all identifiable criteria were removed from any public reports. The author and personnel followed the standards of care for practice in the clinical setting. All electronic files containing identifiable information were password-protected to prevent access by unauthorized users. The project coordinator had a personal login to electronic health records and all patient information were kept in the office separate from anything submitted to JSU or taken to another location. No further risks were introduced to patients other than the usual risks from receiving standard care.

## **Conclusion**

Chronic conditions in the primary care setting must have close follow-up by healthcare providers. Continuing to follow-up with patients can help decrease further complications with these conditions, reduce hospitalizations, and ensure continuity of care. This study showed that close follow-up with individuals with diabetes has the potential to help decrease hemoglobin A1C in the adult population; therefore, decreasing both current and future complications, and increasing the cooperation of patients with their care. Nursing has a strong foundation based on promoting quality of life for patients. This project reflects that goal and has potential to advance it within the

profession moving into the future. In addition, programs such as this can be used for other chronic diseases. They will be essential moving into a time when chronic diseases are on the rise and will likely continue to be due to a larger aging population.

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## APPENDIX A

October 30, 2020

Dear Adrienne Shambray:

Your proposal submitted for review by the Human Participants Review Protocol for the project titled: "Decreasing the Impact of Diabetes in the Adult and Elderly Rural Health Population Utilizing Phone Calls as Part of the Chronic Care Management Program" has been approved as exempt. If the project is still in process one year from now, you are asked to provide the IRB with a renewal application and a report on the progress of the research project.

Sincerely,



Joe Walsh  
Executive Secretary, IRB

APPENDIX B

October 20, 2020

To whom it may concern:

Adrienne Shambray, Doctor of Nursing Practice (DNP), student at Jacksonville State University has permission to conduct a Quality Improvement DNP Project, titled — Decreasing the Impact of Diabetes in The Adult and Elderly' Rural Health Population Utilizing the Chronic Care Management Program. This DNP Project may be conducted at this facility.

Sincerely,

A handwritten signature in cursive script that reads "Paula Howard". The signature is written in black ink and is positioned above the typed name.

Practice Administrator

## APPENDIX C

### CONSENT FOR PARTICIPATION IN A STUDY

**Title of Project: Decreasing the Impact of Diabetes in the Older adults Rural Health  
Population Utilizing Phone Calls as Part of the Chronic Care Management  
Program**

Investigator Names: Adrienne Shambray & Laura E. Barrow

E-Mail Contact Information: [ashambray@stu.jsu.edu](mailto:ashambray@stu.jsu.edu) , [lbarrow@jsu.edu](mailto:lbarrow@jsu.edu)

**You are being asked to participate in a research study. Before you give your consent to volunteer, it is important that you read the following information and ask as many questions as necessary to be sure you understand what you are being asked to do.**

#### **Investigators**

Adrienne Shambray, MSN, CRNP, FNP-C

Laura E. Barrow, PhD, RN

#### **Purpose of the Research**

This project identifies patients who qualify for the Chronic Care Management Program (CCM) using criteria from of the Centers for Medicare and Medicaid Services and who are currently diagnosed with Diabetes Mellitus. The project will utilize monthly phone calls in order to better assist patients in managing their Diabetes. Identifying any complications of this disease early may help reduce complications and improve your overall quality of life.

### **Procedures**

If you volunteer to participate in this study, you will be asked to agree to monthly phone calls lasting approximately 20 to three0 minutes. These calls will focus on your current illnesses, and specific questions about your Diabetes will be asked. You will be asked to provide information about your daily blood glucose levels and your daily medication.

### **Potential Risks or Discomforts**

There are no foreseeable risks, however, you may experience positive or negative feelings as you respond to questions. The phone calls will be scheduled during business hours and at your convenience. There are no costs associated with your participation in the study. You have the right to discontinue participation, temporarily or permanently, without any consequence.

### **Potential Benefits of the Research**

There are personal benefits for participating in the study. Your participation may identify complications of your diabetes and lead to earlier treatment. The nursing profession and clinical practice standards may increase due to the knowledge obtained in this study.

### **Confidentiality and Data Storage**

Identifying information will be confidential and not be shared with anyone outside the study.

Data, specific to the study, will be stored in the researchers' offices on a password-protected computer. Following the completion of the project, the forms will be destroyed six months after the study.

### **Questions, Participation, and Withdrawal**

Your participation in this research study is voluntary. As a participant, you may refuse to participate at any time. To withdraw from the study, please contact the researchers at 205-201-three111, 256-490-three625, [ashambray@stu.jsu.edu](mailto:ashambray@stu.jsu.edu), or [lbarrow@jsu.edu](mailto:lbarrow@jsu.edu).

### **Reasons for Exclusion from this Study**

The exclusion criteria for this study include patients with the inability to speak English, not qualifying for the CCM program, or with no diagnosis of diabetes mellitus 2.

APPENDIX D

Participate Information Form

Name:

Age:

Gender:

Self-identified ethnic identification:

A1C prior to entering program and initiating phone calls: \_\_\_\_\_

Self- reported glucose scores:

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Any notes needed regarding glucose:

Self-reported medication reconciliation:

No problems identified: \_\_\_\_\_

Problems identified:

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Any actions taken by provider:

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If this is month three, follow up A1C result:

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