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## Whole Health Peer Pathway and Conventional Medicine to Promote Health in Diabetic Veterans

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*Walden University*

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# Walden University

College of Health Sciences and Public Policy

This is to certify that the doctoral study by

Delcina Augustin Doreus

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Walden University  
2022

Abstract

Whole Health Peer Pathway and Conventional Medicine to Promote Health in Diabetic

Veterans

by

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Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

Walden University

May 2022

## Abstract

The Veterans Health Administration has been one of the first to adopt the Whole Health approach in combination with therapeutic treatment, which is recommended to promote disease management and prevention of comorbidities associated with diabetes. However, this modality has not been adopted by the health care system. The purpose of this study was to examine the association between the veterans who have been in the Whole Health Program in combination with therapeutic treatment and those who have only been focusing on the therapeutic treatment regimen. The variables were A1C levels and adhering to medication renewal to determine whether veterans in the program had better self-care management to help control their diabetes and prevent comorbidities. The behavior health model, which focuses on how peer-to-peer support can influence decision-making and promote positive behaviors, was used to show the effectiveness of the Whole Health Program. Chi-square tests were performed for both research questions, and multivariate logistic regression was used to control for age, gender, and veterans with a co-pay. The results of the Chi-square indicated that there were significant differences between the veterans in the Whole Health Program and those not in the program. Adding the covariant for age, gender, and co-pay did not change the result that Whole Health participants had significantly lower A1C and improved medication adherence. The  $p$  value for both variables was  $p = 0.001$ ; therefore, indicating a statistically significant result. The positive social change of the study includes encouraging an inclusive environment for patients who have acquired an illness and will need support in the process of disease management.

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## Dedication

This doctoral study is dedicated to my grandmother, who died of undiagnosed unmanaged type 2 diabetes over 35 years ago. After I became a nurse, I realized that diabetes is one of the silent killers of the Haitian population. It also struck me that all the signs and symptoms my grandmother was experiencing for years before her passing were signs of type 2 diabetes. I could not help her, but I opened a non-profit organization called World Health Awareness Team in her name. To no surprise, my father was also diagnosed with prediabetes, but this time we caught it and managed it on time. It has been over 30 years since my father was told he was pre-diabetic; however, until today, his A1c remains below seven.

I also dedicate this doctoral study to my best friend Vernet Blanc, who has inspired me and reminded me why I need to complete this study regardless of the obstacles I am encountering. I am not sure I could have reached this career stage without his support. I dedicate this study to my brothers and sisters and my parents Jean Abel Augustin and Marie Marth Janvier, who support me in every decision I make. Unfortunately, my stepmother, Ms. Mary Math Janvier, has moved to a better place in heaven and will not be present for my graduation. Finally, my mother, Helene Desmoulin, is so proud of me and has done all in her power for me never to give up. Thank you.

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## Section 1: Foundation of the Study and Literature Review

Alternative medicine involves using non-pharmacological treatment options for common conditions, such as pain and mental health or psychological disorders (Song et al., 2009). The Whole Health peer pathway is an innovative program of alternative medicine to help deal with medical issues by taking an unconventional approach to self-care (Song et al., 2009).). The Whole Health approach uses different modalities, such as mindfulness, meditation, yoga, and guided imagery, based on the individual's personal needs to achieve the maximum benefit for the patient. The Whole Health peer pathway encourages a combined approach of alternative medicine and traditional medicine to improve patients' outcomes and promote self-care. This approach could be beneficial when dealing with complex diseases like diabetes, as this care may be particularly important where patients following instructions is important to maintaining their health, such as taking medications regularly or daily testing for blood sugar levels. This recommendation is based principally on the evidence from randomized controlled trials of complementary medicine and how complementary medicine can augment the benefits of traditional medical care.

The Veterans Administration (VA) started using these types of complementary medicine techniques in 2011; however, there is still room for growth in the promotion of programs and treatment (Shaddy et al., 2017). This study was conducted to help discuss how the Veterans Health Administration (VHA) facilities can help veterans start managing diabetes by adhering to traditional treatment, which would decrease their A1c

levels. Using complementary medicine techniques like mindfulness can help increase their self-awareness and their personal role and responsibility in treating diabetes.

### **Background**

Many approaches to encourage active patient engagement in their personal care could lead to better management of diabetes and possibly the prevention of diabetes complications. A few studies have shown that there is a new approach that can be used to encourage better management and adherence to diabetes treatment—the Whole Health approach (see Shaddy et al., 2017). The Whole Health approach does not diminish the importance or effectiveness of traditional therapeutic medicine; instead, it adds value to the pharmacological approach by encouraging patients to take charge of their health outcomes by adhering to the treatment plan by using techniques like mindfulness and self-awareness (Tucker et al., 2013). The Whole Health approach is focused on using the patient-centered care approach to improve self-care while allowing patients to assume an active role in decision making involving their personal health care. This approach has been a cost-effective, less invasive way to enhance the quality of care, providing more comprehensive attention to the patient, and benefitting patients with diabetes (Bokhour et al., 2020). The Whole Health approach also incorporates health coaching as a means of improving patient compliance and attention to their disease issues. For instance, health coaching has been instrumental in helping veterans with suicidal ideation to develop new ways to cope with the civilian world and their traumas from combat and military experience (Denneson et al., 2019).

The Veterans' Health Department has been working with the Whole Health approach for the last 6 years (Bokhour et al. 2020). In the United States, veterans have higher rates of uncontrolled diabetes and comorbidities. There are 25% of veterans, equivalent to 1.1 million veterans, who are known to have diabetes who are receiving care at the VHA (Shaddy et al., 2017). Thus, the VA started employing an approach involves using a combination of treatment approaches to promote wellness and well-being by engaging the patient in the treatment plan while improving patient adherence to the recommended traditional treatments for diabetes. However, there is a gap in knowledge about this approach and how effective it can be as an adjunct to traditional medical approaches. Evaluating their success in improving diabetes health measures by using complementary medicine could be valuable in developing an understanding of how complementary medicine may be used to improve monitoring and adherence for many types of complicated health conditions.

### **Problem Statement**

Integrating Whole Health peer pathway modalities can be used to promote shared decision making, self-engagement, and self-motivation while allowing patients to attend to and take active steps to achieve their desired goals (Myrick & del Vecchio, 2016). Previous research has shown that there is a difference in the outcomes of self-management between traditional therapeutic treatment for type two diabetes as opposed to combining treatment of mind-body medicine and traditional medicinal treatment for the veteran population (Tucker et al., 2013). This study was necessary to investigate how the Whole Health peer-pathways can help promote self-engagement in managing diabetes



in order to encourage an enhancement of conventional methods in the United States when caring for the veteran population. There is a gap in the literature on how specifically Whole Health peer pathways, in combination with modern medicine, can help promote better health in the veterans' population that has been diagnosed with diabetes. This study aims to improve the understanding of how the Whole Health pathway, in combination with therapeutic medicine, can help to improve the health of the intended population. This research will attempt to fill in the gap in the literature by conducting a secondary data analysis from established national databases to examine the types of issues associated with diabetes that can be improved using this type of complementary medical approach, including Whole Health pathway techniques and coaching.

### **Purpose of the Study**

The purpose of this study was to understand how veterans with diabetes would benefit by adding complementary medicine treatment methods to their treatment plan. This understanding will be possible by researching how a combination of the Whole Health approach and traditional medicine can help improve the quality of life of the veteran population who suffer from type 2 diabetes. This study will provide broader insights into the use of a combined approach of using mind–body medicine from the Whole Health approach and modern medicinal treatment for the veteran population as opposed to only modern medicine and how this might lead to improvements of specific health measures, such as drug adherence and hemoglobin A1c.

## Research Questions and Hypotheses

Research Question 1: Is there a difference in hemoglobin A1c levels in veterans with diabetes receiving a combined treatment of mind–body medicine and pharmacological medicine treatment as opposed to receiving only pharmacological treatment?

$H_01$ : There are no statistically significant differences in the A1c level of veterans receiving only pharmacological treatment for diabetes as opposed to combining treatment of mind–body medicine and pharmacological treatment.

$H_11$ : There are statistically significant differences in the A1c level of veterans receiving only pharmacological treatment for diabetes as opposed to combining treatment of mind–body medicine and pharmacological treatment.

Research Question 2: Is there a difference in the behavioral health choices of medication adherence in veterans with diabetes receiving a combined treatment of mind–body medicine and pharmacological treatment as opposed to receiving only traditional pharmacological treatment?

$H_02$ : There are no statistically significant differences in the behavioral health choices of medication adherence in veterans receiving only pharmacological treatment for diabetes as opposed to combining treatment of mind-body medicine and pharmacological treatment for diabetes.

$H_12$ : There are statistically significant differences in the behavioral health choices of medication adherence in veterans receiving only pharmacological treatment for

diabetes as opposed to combining treatment of mind-body medicine and pharmacological treatment for diabetes.

Research Question 3: What is the relationship between A1c and medication adherence in veterans with diabetes participating in the Whole Health Program, controlling gender, age, and co-pay.

$H_{03}$ : There is no statistically significant association between A1c and medication adherence in veterans in the Whole Health Program controlling for gender, age, and co-pay.

$H_{13}$ : There is a statistically significant association between A1c and medication adherence in veterans in the Whole Health Program controlling for gender, age, and co-pay.

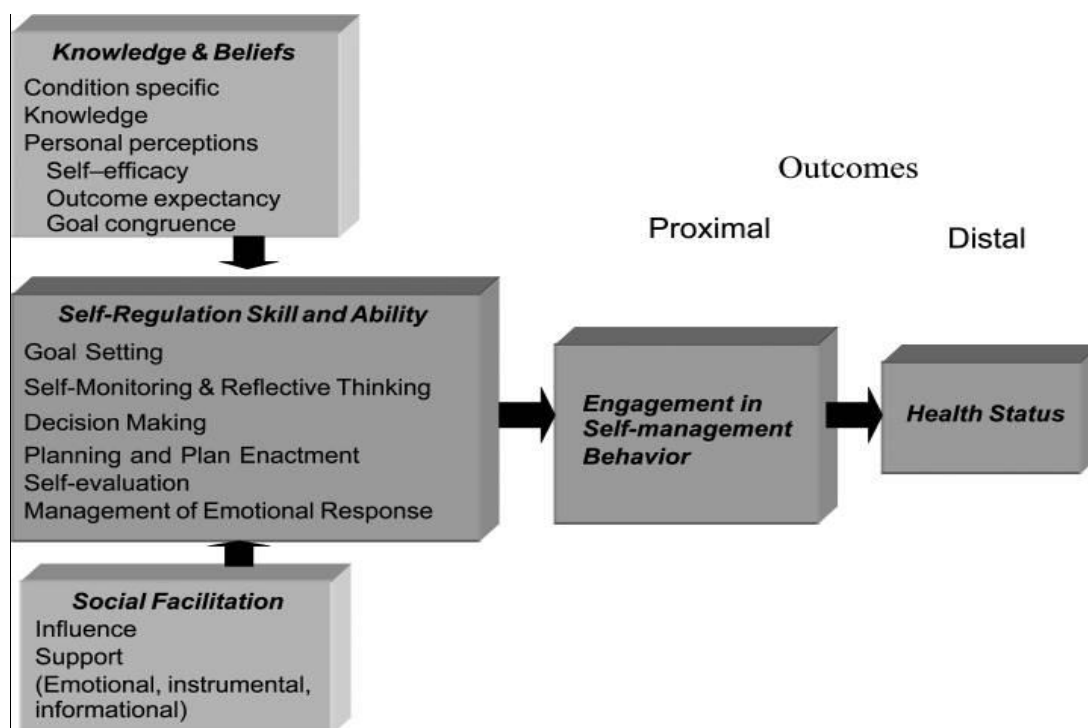
### **Theoretical Foundation for the Study**

The Whole Health approach is based on the theory of health behavior change, which is a model that explains how changes in knowledge and beliefs can influence health by promoting self-management and better self-care (Ryan, 2009; see Figure 1). The theory of health behavior context for this study was also based on the Denneson et al.'s (2019) theory that psychological well-being can be increased by promoting Whole Health approaches to care. These approaches have been successful in the veterans' population in addressing complex health problems, such as hypertension and heart disease. This theory can also be applied to medical disease, in that these types of interventions targeted at empowerment and mindfulness can significantly improve patient adherence to medication regimens and diet and exercise programs designed to improve

their health. For the current study, a program designed to improve mindfulness and self-awareness about their disease can help them to improve their self-regulation and personal ability to take active steps to monitor and improve their health. This can be assessed by examining blood sugar levels as well as potential changes in medication adherence that might be associated with incorporating these kinds of changes in their care program.

**Figure 1**

*Theory of Behavioral Health Change*



**Nature of the Study**

This study was a retrospective quasi-experimental design based on collected patient data and the aforementioned research questions (Moser & Krorstjens, 2018). This

quantitative study used secondary data to answer questions by examining relationships between the pertinent variables. A chi-square was used to assess Question 1, which uses a continuous dependent variable of hemoglobin A1c and the categorical independent variable of one group who practices only traditional medicine and the other group who practices a combined approach of traditional medicine and the Whole Health approach. Question 2 was also answered with a chi-square analysis by using a continuous dependent variable of missing appointments and adherence as assessed by medication refills. The chi-square analysis was used to measure whether there is a significant difference between mean values for adherence.

### **Literature Search Strategy**

For the current literature review, the key search included the following terms: *Whole Health, Conventional Medicine, Diabetes, Health Promotion, Disease Prevention, Patient Centered-Care, Veterans, and veterans' health*. The most common search engines used were Walden University Library, EBSCO Connect, PubMed, National Center of Biotechnology Information, and Europe PMC. Selected articles relating to a combined treatment approach of mind–body medicine and traditional medical treatment are discussed in this literature search section. The articles also explored the many barriers that practitioners face when trying to encourage the use of new approaches in combination with traditional medicine. For example, in a study of diabetes patients and their practitioners, researchers examined data to assess if there might be a significant pattern of general practitioners and their type 2 diabetes patients concerning education

and management (Lanhers et al., 2015). This study identified barriers that made the use of these kinds of methods more challenging in primary care settings.

### **Literature Review**

This section addresses the relationship between integrative medicine combined with traditional medicine and how this approach may improve hemoglobin A1c levels by increasing medication and diet adherence in people with type 2 diabetes. The review of literature will also discuss the challenges and the success stories for this type of program. The purpose of this review was also to examine the factors associated with veterans being vulnerable to diabetes, which would lead to death. The literature also addresses the most common contributors to nonadherence to self-care in the veteran population.

### **The Whole Health Approach**

The Whole Health approach encourages people to participate in self-care and exercise programs such as Tai Chi, yoga, and walking. Based on a study of 99 participants with type 2 diabetes who participated in Tai Chi and self-care, there was a significant decline in HbA1c level for those who practiced the exercises more regularly and who were involved in the self-care program (Song et al., 2009).

### **Mind–Body Medicine**

Mindfulness is one of the mind–body medicine modalities that helps individuals be more aware of thoughts and feelings to enable them to make the right choices for their well-being (Whitebird et al., 2018). Mindfulness can be combined with traditional medicine, which can have benefits in enhancing the quality of life (Raghebian et al., 2015); this can be crucial for those with type 2 diabetes. There is no one method of mind–

body medicine; therefore, adopting any of the methods in addition to traditional medicine has been shown to be effective in improving adherence (Whitebird, 2012). One of the ways to improve compliance among veterans with type 2 diabetes is by encouraging self-management with techniques like mindfulness. Based on a study of diabetes patients who participated in mindfulness exercises like sitting, standing, walking, and supine forms of meditation to relieve stress, those who adhered to the intervention program showed significant improvements in their diabetes, with a change in pre-management from 9.2 HbA1c to 8.4, with a significance of  $p = 0.004$  (Whitebird et al., 2018).

### ***Tai Chi Modality of Mind–Body Medicine***

A study by Sukhee and Rhayum (2012) was conducted to determine if Tai chi, which is one of the mind-body modalities, was introduced as a moderate-intensity exercise helped patients with type 2 diabetes to control their neuropathy symptoms and to improve their quality of life. The study was conducted using a quasi-experimental design of a pre- and post-test. The fifty-nine participants were from a Korean university hospital outpatient clinic, and they had type 2 diabetes with symptoms of neuropathy. The participants were required certain clearance from their primary care provider before they could engage in the study (because the study included exercise). Other inclusion criteria were that they have to have an HbA1c level greater than 7.0%, permission from their healthcare provider, and informed consent to be part of the study. The study used a priori power analysis, to determine the number of participants needed. The program required one hour of Tai Chi per session twice a week for 12 weeks. The outcome measure of the pre and posttest was assessed before and after the 12 weeks program. A repeated

measures t-test was used to assess the differences between the groups' scores based on the significance level of 0.5 (Sukhee et al., 2012). The study found a significant benefit in reducing hemoglobin A1c and improving neuropathy symptoms when participants consistently participated in the exercise and mindfulness program. In the end, the study was able to prove that Tai Chi, as one of the modalities of mind-body medicine, could help improve glucose level (A1c level), balance, reduce neuropathy symptoms, and improve some detention of quality of life (Sukhee et al., 2012).

### **Measuring Drug Adherence at the Veterans Affairs Outpatient Clinic**

The primary issue among the veterans in dealing with chronic health problems like diabetes is often related to adherence to drug administration for their medical condition. Taking medication as prescribed requires motivation and understanding to take the steps needed for self-care. Lack of motivation and poor self-care and medication adherence among diabetes patients could lead to comorbidities resulting from poor glycemic control. Self-care and diabetes self-management is crucial for better outcomes for the patients, and reduction of adverse consequences associated with uncontrolled diabetes. In a study by Lee and colleagues (2020), a pre-post interview study design was conducted to examine this issue of adherence and self-care in veterans. During the study, an M-DRAW tool was used to examine how primary care clinics are handling this issue of medication adherence. In 2017 to 2018, 88 veterans from the VA Linda Health System participated in this study. The inclusion criteria were that patients had to speak English, be 18 years or older, have type 2 diabetes, live in a non-institutional setting, and take at least one diabetes medication (Lee, et al., 2020). The participants were asked to report



self-adherence measures concerning how they follow their medication regimens. The M-DRAW questionnaire asked about what barriers the veterans have that prevented them from adhering to the medication treatment plan on a 4-points frequency scale. The study revealed a three times greater number of obstacles interfering with adherence to medication regimen when compared to a nonveteran sample (Lee et al., 2020). It was concluded that reducing the number of barriers to adherence will contribute to improving medication adherence, that this improvement in following recommended medication treatment programs would result in improving clinical outcomes.

### **The Integrative Health Wellness Program: Complementary and Alternative Medicine Clinic for Veterans**

The benefit of combining an integrated health approach with complementary medicine in the veterans' health administration clinical care setting has been demonstrated in a number of studies. Integrative health is also known as the Whole Health approach, and it is one of the newest wellness programs offered by the VHA to promote self-care and improve management of chronic conditions (Holliday, et al., 2015). Due to the complexity of many of the veterans' health care conditions, other approaches such as complementary and alternative medicine have been shown to improve wellness and self-care.

The Integrative Approaches include yoga, peer to peer coaching, group auricular acupuncture, qigong, and health education. A study was conducted by Holliday and colleagues (2015) using a prospective cohort design to track the specific services used in

this program and the effects on aspects of the veterans' physical and mental health (Holliday et al., 2015).

A total of 740 consults and 325 Veterans were enrolled in the Integrative Health and Wellness program in the Holliday study locations; however, only 226 Veterans consented to participate in the study. The veterans who took part in the program presented with the following conditions: depression, stress, insomnia, and pain, which interferes with their day-to-day activities. The veterans were asked to be part of a one-hour orientation session for the weekly Integrative Health and Wellness program. The program used the first 30 minutes of this orientation on education and learning about the program's different benefits. The veterans then reviewed and completed a clinical questionnaire. This initiative was designed to conduct this pilot study to evaluate the health outcomes among veterans who were using the Integrative Health and Wellness program, by reviewing their medical records and evaluating the self-questionnaire responses. Based on the result, there were significant clinical improvements from those Veterans who were engaged in using the program, particularly compared to patients who were not using these types of complementary medicine programs.

### **Complementary and Integrated Health Approaches: What Veterans Use and Want**

Complementary and integrative health approaches are also known as the Whole Health approach and have been used for addressing multiple issues in the veteran population. These complementary approaches are not limited to one simple program and offers opportunities to address many kinds of techniques that can be used for multiple complex medical conditions. In the program that the VA has adopted, veterans have the

opportunity to choose which of the modalities would be best for them. The method provides a sense of self-engagement and confidence to move forward while allowing the veterans to take charge of their own health care outcomes. A study was conducted by Taylor (2019) to examine how using these approaches like yoga, acupuncture, and meditation can help veterans who suffer from other conditions such as depression and anxiety, pain, and other psychological issues. The methods used for this study included a national survey of how 26 out of the programs of complementary and integrative health approaches helped a large number of (n=3346 veterans) in July 2017 with a variety of clinical problems.

Complementary and integrative health approaches include programs that provide non-pharmacological treatment that, when combined with pharmacological treatment, can increase wellness by promoting adherence and compliance for traditional medication programs while reducing health care costs (Taylor, 2019). The study also reported that in the past year, 52% of veterans used complementary and integrative health approaches such as massage therapy (44%), chiropractic (37%), mindfulness (34%), and others; Furthermore, the results showed a significant number of Veterans (84%) who said they would like to know more about complementary and integrative health approaches and its programs. Complementary medicine has been used effectively in the veterans' health administration as one of the fastest growing programs, and the complementary and integrative health approaches provides a needed a combination of health approaches to help the veterans adhere to the recommendations from their traditional healthcare team, and to take control of their health.

## **Preventive Medicine Reports**

Many factors are associated with the risk of diabetes among veterans. Many veterans have psychological issues such as post-traumatic stress disorder, which contributes to the negative behaviors that can lead to cardiovascular disease and diabetes (Hoerster et al., 2019). Many people who have these kinds of psychological issues do not exercise, do not eat well, and often do not take active steps to address medical problems that they have. A study by Hoerster (2019) was a cross-sectional survey conducted to support this hypothesis. This study was conducted in 2012-2013 using 657 veterans. This study was conducted to confirm that the Whole Health approach's specific pathways were able to help those with depression and to help them to modify their health behaviors to more positive. The survey was mailed to the veterans in the northwest who had at least one visit in primary care or post-traumatic stress disorder clinics. The DETER model was used for data collection using demographic variables such as age, sex, and race/ethnicity, and mental health behavior. Veterans' mental health symptoms were also measured with a possible score of 85, with the higher scores indicating a greater severity of mental health issues. Veterans' health behaviors were linked to their increased risk for cardiovascular disease and diabetes. For each of the veterans, the alcohol consumption test behavior was also examined. This test is called AUDIT-C, and it was used to measure alcohol consumption with a possible score from 0 to 12. Those who consumed the most alcoholic beverage have higher scores. After the study, it was determined that there was enough evidence to conclude that post-traumatic stress disorder symptoms are associated with behavior patterns that could cause veterans to suffer from chronic health

issues such as diabetes (Hoerster et al., 2019). This study suggests that methods like complementary medicine programs designed to increase empowerment and self-awareness may be useful in address these psychological issues, which could also improve their ability to adhere to recommended medical treatment programs.

### **Integrative Health Coaching for Patients with Type 2 Diabetes**

Integrative health involves using the ideas of mind-body medicine for health promotion and disease prevention. A study was conducted to evaluate how well this approach would help patients with type 2 diabetes by helping them change their behaviors and make better choices (Wolever et al., 2010). During the study, 56 participants were recruited. The inclusion criteria were having type 2 diabetes, informed consent to participate in a six-month study that includes coaching, having challenges to medication adhering, speaking English, taking oral medications, and agreeing to participate in social support. The participants were excluded if they had dementia, Alzheimer's disease, schizophrenia, or other cognitive impairment. The participants were recruited by sending flyers, advertising in newspapers, and online advertisements. This randomized controlled trial required that patients answer their demographic and medical history and undergo a psychosocial questionnaire before participation in the program. The integrated health coaching intervention focused on seven principles: taking medication as prescribed, stress reduction & self-care, exercise & physical activity, personal development, nutrition, communication & relationship, and the center of the program- self-awareness. The entire program focused on using group support and a mind-body approach to help with medication adherence (Wolever et al., 2010). Researchers

used the McNemar test to analyze those who have missed medications. Based on the study findings, data revealed that there was support for the hypothesis that the integrated health program using coaching and peer support with the seven modalities would significantly assist with improving medication adherence. Participants in the coaching program showed a greater than 7% significant improvement from baseline A1c (Wolever et al., 2010). This finding supports the conclusion that these kinds of programs can be used to assist veterans and other patients to maintain the recommended medications prescribed by their doctors.

### **Diabetes Program: Integrated Care**

Managing diabetes is a growing problem that cannot be addressed without patient involvement; however, patients need motivation and guidance. Cost is also tied to issues of non-compliance with the treatment plan. Other factors that affected adherence to recommended treatment plans are insufficient clinical governance, limited access to care, and lack of patient engagement (Simmons et al., 2018). According to a study by Simmons and colleagues (2018) in Southwestern Sydney, Australia, researchers revealed how integrative medicine with traditional medicine could improve health by reducing complications, reducing hospitalization, and decreasing cost. The study was designed to demonstrate how integrative peer-to-peer support improved population health by partnering with integrated clinical services to provide a bi-monthly clinician and peer reference group meeting to support adherence behaviors (Simmons et al., 2018). There were 46,000 inhabitants from 19 different villages, and in that town, 2100 of them habitats are known to have diabetes (Simmons et al., 2018). The program provided local

diabetes group education from dieticians, clinicians, endocrinologists, diabetes foot screening, the health pathways to give referrals as needed, and local awareness programs. There were four facilitators for each group, and they were trained to lead the groups. The program's goal was to have those patients with an HbA1c of 10.2 or higher before the program to decrease their levels by 1.2% following the end of the program (Simmons et al., 2018). The study was unable to assess the new program's outcomes since this was a new initiative; however, the stockholders believed that this type of intervention can provide a new way to improve care and decrease disparities in Australia (Simmons et al., 2018). Starting this program brought many challenges; however, based on the initial observations, a program focusing on allied health and prevention was deemed valid and had potential for improving outcomes for patients with diabetes. Although final assessments have not been completed, initial results did show clearly that patients involved in the programs did see improvements in their diabetes through lower blood sugar values.

### **Improving Diabetes Medication Adherence: Successful, Scalable Interventions**

A study by Zullig and colleagues (2015) employed an approach to understanding how to reduce medication non-adherence that is crucial for this current research study. Although it is the goal to reduce medication intake and adapt to other means of blood sugar control, such as diet and exercise, including those using the Whole Health approach to stay healthy, adherence to prescribed medication is also a key component for preventing further needs to increase medication dosages. "Non-adherence has been linked with poorer treatment outcomes and progression of disease symptoms and complications"

(Zullig et al., 2015). It is understood that poor medication adherence among diabetes patients is contributing to poor outcomes and more comorbidities (Zullig et al., 2015). Based on that hypothesis, Zullig and colleagues decided to examine which approach to improving medication intake adherence for those with diabetes was most effective (Zullig et al., 2015). They identified key characteristics which they believed to have made adherence more useful and accessible for patients. This article also mentioned that there are many programs to promote medication adherence; however, they did say that many of these programs have not been successful. During this meta-analysis review, 53 different articles that discussed the different ways to promote adherence to medication for those with diabetes were examined. The various interventions were wide ranging, from pharmacy driven to educational intervention programs. The pharmacy guided interventions were based on patient settings and their public health systems. According to the study, seven interventions with distinctive approaches such as education, public health approach, pharmacy interventions, assessment of cost, and community health awareness, were most likely to help with improving medication adherence. Researchers found that the interventions which related their success directly to cost benefit were most likely to be adapted (Zullig et al., 2015). Furthermore, the researchers noted that resources to proceed with these programs have presented a challenge for the programs' continuity, and even initially successful programs had to be canceled because of lack of funding. The study results concluded that a similar approach involving more patient involvement in supporting each other directly might be more beneficial and sustainable since the cost would be significantly less than if other resources were needed.



## Definitions

*Adherence:* A term used to measure compliance and persistence. In the present study, adherence is operationalized using the proportion of refills filled by the patient divided by the doctor's total refills. It measures the extent to which the Veteran or patient would be consistent with taking prescribed medication. It would also allow researchers to examine the potential impact of non-adherence to the treatment plan and clinical outcomes.

*Civilian world:* A common term used in the VA when a veteran is reentering back to society after being in the military and abroad.

*HgbA1c:* Test that measures the average blood sugar levels in the bloodstream over the past three months, to help diagnose prediabetes and diabetes.

*Mind-body medicine:* Mind-body medicine is a health practice that combined a patient's mental focus by using different modalities such as deep breathing, yoga, and other forms of mindfulness to relax the body and mind and promote a healthy lifestyle. It allows for reflection and creating meanings.

*Whole health peer pathway:* An innovative program of alternative medicine to help deal with some medical issues by taking an unconventional approach to the next level of self-care.

## Significance

The results of this study may inform stakeholders and researchers about the circle of health and how to combine different strategies to improve medical outcomes, and aid in understanding what specific interventions matter most to many aspects of human well-

being when it concerns diabetes management and how addressing self-care can help to improve how patients can take active steps to improve their own health. Many studies have focused on finding different types of pharmacological treatment for diseases such as diabetes. Recently, the American Diabetes Association has shifted their focus from a traditional medical program to a more comprehensive, proactive, and preventive approach to diabetes care (American Diabetes Association, 2020). Although pharmacological treatment can be crucial in the intervention of diabetes, noncompliance with the use of those medications, in addition to failure to follow diet and exercise recommendations, may cause more harm than has been previously appreciated (Polonsky, & Henry, 2016). Researchers have noted that about 45% of people with diabetes are not able to control their hemoglobin A1c level, and one of the contributing factors is often related to not adhering to the pharmacological treatment designated for them by their healthcare providers (Polonsky et al., 2016).

Furthermore, in many cases, non-adherence does not necessarily mean unwillingness, but it may also be related to many potential factors that can impact the inability to adhere. Some of these factors may include lack of understanding in patients, lack of access to medications because of financial challenges, and complicated medication regimens that may be difficult to follow. The Whole Health Approach which has been adopted by the VA is designed to have a team approach in finding out the reason for that inability and bring it to the Table for discussion and resolution. The Whole Health Approach combined alternative methods with therapeutic medicine and has started to show a difference in changes in health that show how the veterans who are beginning

to take control of their conditions and do something to positively change their health outcome while focusing on what is important to them can make positive changes in their health outcomes (Denneson et al., 2019).

The Whole Health Approach is designed to have the veteran in the center of their own healthcare program, by looking at what matters to that individual when it concerns their interactions with the community, the environment, and personal relationships (Bokhour et al., 2020). This research will describe how this approach uses a combination of techniques to help the veterans cope with everyday life and uses a team approach to improve their health (Denneson et al., 2019).

### **Summary**

Based on the literature review, the implementation of a combined healthcare method which combines the principle of the Whole Health Approach and traditional medicine may be one of the best strategies to encourage self-management, which can lead to improved adherence to treatment and subsequent lowering of hemoglobin A1c levels. According to researchers, there is a gap in knowledge and implementation of this integrated healthcare modality. The concentration of traditional models providing healthcare is focused on the hospital and the clinic settings but adapting the Whole Health approach, which includes a community approach to care, has not been widely adapted (McLeod et al., 2019). The VA adopting the Whole Health Approach program has provided a unique opportunity to assess the effectiveness of adding these complementary medicine modalities to care. The Veterans 'population is one of the best groups to potentially benefit from this combined preventive treatment plan. The plan in this

program is to use a community approach of peer-to-peer communication to encourage the veterans to support each other to improve their ability to practice self-care. According to literature reviews, veterans in this program gather together to communicate with each other as a form of strength and a feeling of belonging (McLeod et al., 2019). They share ideas of what works and find resources to help them cope with the civilian world. They are also sharing stories that led to improved adherence and improvement of their care. Researchers from the literature reviews discussed the noticeable gap in adopting this new practice of combining the Whole Health approach with traditional medicine to benefit those with type two diabetes, despite results that demonstrate the effectiveness of this type of program in improving medical outcomes.

## Section 2: Research Design and Data Collection

The Whole Health approach was adopted by the VA system to help those with type 2 diabetes take better control of their own care, but the approach has not been widely adopted. The purpose of this retrospective quantitative analysis was to examine how the Whole Health Peer Pathway as employed by the VA health system, which consists of a combined approach of alternative methods with traditional medicine, can assist those veterans with type 2 diabetes. These methods may be able to help these veterans to better adhere to their treatment plan, which could lead to a decrease in their hemoglobin A1c level and less negative outcomes from their diabetes. This section focuses on the study design, the sample, and analytical techniques that were used to address the research questions.

### **Research Design and Rationale**

The study used case-control design with a retrospective quantitative analysis to assess previously collected data and identify whether the sample population of veterans in the Whole Health Program received a combined mind–body medicine approach and traditional treatment instead of only receiving traditional therapy. The goal was to identify whether the mind–body medicine approach can improve adherence and treatment outcomes. It was also essential to explore these veterans' quality of life and how feasible it was for them to actively participate in their care as part of participating in this program. Factors such as suffering from multiple anomalies, measures assessing their coping with the civilian world, and mental health behaviors were also assessed in addition to whether they had diabetes and their outcomes following the program. Confounding variables such

as kidney disease and aging which may interfere with A1c levels as well as cost and co-pay, which may interfere with adhering to medication renewals were also accounted for.

### **Secondary Data Types and Sources of Information**

A common source for secondary data in studies about veterans is the Corporate Data Warehouse and the Decision Support System (DSS). These databases allow users to export data from the selective VHA Systems and Technology database module. These systems are protected, and they are located within a more significant database called the VHA Support Service Center (VSSC). The system is referred to as a metadata record system for the VHA. This database requires station level access before researchers are able to retrieve data. Data from that system includes a collection of data from the different electronic systems of the VHA, such as Computerized Patient Record System (CPRS), VHA Systems and Technology, Almanac, and more. The CPRS uses health factors to organize and send data to the VSSC database for other IT users as well as researchers. Knowing that the VHA has collected substantial data regarding multiple and clinical measures of Whole Health and people's well-being, additional data were gathered from the National Center for Whole Health in the VA health care system since the start of the program in 2012.

Another source for data collection was the health information exchange, an electronic transfer database that organizes health care information (Sylvia et al., 2015). These data are used to improve quality and health care outcomes; therefore, this system resonates well with the goals of the Whole Health Peer Pathway employed by the VA other health care providers in the United States. After requesting and being granted

access to the VSSC, I analyzed the data to uncover patterns and trends to address the research questions. Charts or tables were used to as supporting documentation for the results of the research questions and were submitted to inferential statistical analyses, where appropriate.

### **Secondary Data Analysis Methodology**

Based on a case-control study design, previously collected data were explored, focusing on whether veterans had received alternative medicine treatments in combination with traditional medicine versus patients who received only traditional medicine in their care. Veterans with an active diagnosis of type 2 diabetes were identified from previously collected data and screened to determine if they meet study criteria. As a retrospective design, charts the sample were reviewed for regular attendance to doctor visits, and doctor notes were examined if possible. Because of issues of informed consent, access to this type of data may be limited. Data were extracted from a more extensive database based on the ICD-10 code for DM Type II. Specifically, data on adherence to medical treatment were compared to other health outcomes related to diabetes, such as hemoglobin A1c measures.

### **Sample**

The sample inclusion criteria included veterans who have type 2 diabetes, are being treated in the VA system, and are actively participating in the patient care alliance team at a VA hospital. The sample included preferably some patients who are non-compliant with their medication programs. The goal was to measure the percentage of

those who adhere to medication and treatment plans as opposed to those who do not as well as the role of the different programs in the Whole Health Program in adherence.

G\*Power was conducted to determine the sample size. The chosen effect size for this calculation has two probabilities, which are justified based on making better predictions of the sample population. For this study, the alpha level was set at 0.05, indicating the 5% risk of the possibility of a Type I error, where a significant effect is found in the data when such a difference does not really exist in the population. The significant level reflects the probability of a Type I error (Veazie, 2015). This calculation will decrease the possible number of errors in case the result failed to show influence. For the power calculations, I set the power level for this calculation at 80%, which allowed for a strong power for rejection of the null hypothesis if there was indeed a difference in the population means. The total number of participants needed was 128—64 participants for the control group and 64 for the intervention group.

### **Data Analysis**

The analysis involves the following. For Research Question 1,  $\Pr(Y = 1, X = 1)$  H1 = what is the probability of veterans with type 2 diabetes' A1c level ( $Y = 1$ ) when the main predictor (veterans receiving only pharmacological treatment for diabetes as opposed to combining treatment of mind-body medicine and pharmacological treatment) is one standard deviation above its mean, and all other covariates are set to their values? The assumed difference in means of the veterans receiving only pharmacological treatment for diabetes as opposed to combining treatment of mind–body medicine and pharmacological treatment is 0.05.



Research Question 1-  $\Pr(Y=1, X=1)$   $H_0$  = what is the probability of Veterans with type 2 diabetes A1c level ( $Y=1$ ) when the main predictor (veterans receiving only traditional treatment for diabetes as opposed to combining treatment of mind-body medicine and pharmacological treatment) is one standard deviation above its mean, and all other covariates are set to their values. The expected difference in the means of the Veterans receiving only pharmacological treatment for diabetes as opposed to combining treatment of mind-body medicine and pharmacological treatment is 0.05.

Research Question 2-  $\Pr(Y=1, X=1)$   $H_1$  = what is the probability of Veterans with type 2 diabetes adhering to medication ( $Y=1$ ) when the main predictors (veterans receiving a combined treatment of mind-body medicine and therapeutic treatment as opposed to receiving only therapeutic treatment) is at the mean, and all other covariates are set to their mean values. The assumed mean of the veterans receiving only pharmacological treatment for diabetes as opposed to combining treatment of mind-body medicine and pharmacological treatment is 0.05.

Research Question 2-  $\Pr(Y=1, X=1)$   $H_0$  = what is the probability of veterans with type 2 diabetes adhering to medication ( $Y=1$ ) when the main predictors (veterans receiving a combined treatment of mind-body medicine and therapeutic treatment as opposed to receiving only therapeutic treatment) is at the mean, and all other covariates are set to their mean values. The expected difference in the means of the veterans receiving only pharmacological treatment for diabetes as opposed to combining treatment of mind-body medicine and pharmacological treatment is 0.05.

### *Statistical Analyses*

An independent measure Chi-square test was used to determine any significant difference between the mean hemoglobin A1c for the control group compared to the intervention group. To conduct this study, the researcher collected data from 2018 to 2020, to assess at least 60% of the intervention group's sample size. G\* power was used to help calculate the minimum sample size; therefore, the sample size for Research Question 1 totaled 128 participants. Both the control and non-control groups had a 64-participant sample size. For this Chi-square test, the independent variable was the intervention - the use of the Whole Health Peer Pathway program, compared to the control group that receives only traditional medical care for their diabetes. The dependent variables included the A1c level and measures of medication adherence. Potential confounders for Research Question 1 included kidney disease comorbidity and aging.

Similarly, Research Question 2 differences in adherence were assessed between the intervention and the control group, to determine if there was a significant effect of the intervention on measures of adherence. A proportion percentage variable using the analysis Chi-square test to compare the two groups determined if the intervention group's adherence was significantly different from the non-intervention or control group. For this study, the researcher went back two years in the database to attempt to assess if at least 60% of the sample size of the intervention groups would show improved adherence. Potential confounders for Research Question 2 may include side effects, cost of the medication for those with co-pay, and routes of administration.

The Chi-square test was used to examine the proportions in how many times the intervention group succeeded to refill their medication compared to the control group. Appointment measures such as follow ups, missed appointments due to cancelations or no show, and kept appointments were also documented and included in the study. The results were documented ordinally with a yes or no to adherence to medication refills

For the assessment of adherence, each participant received a “one” for every refill of a diabetic medication and a zero for extremely delayed or no refills when a prescription was given to them by their provider. The score was then combined, with a higher score indicating the better adherence they have. The same scenario and calculation were done for missing appointments. For example, each sample received a one for every time they keep an appointment and a zero for every appointment they missed. The two groups (intervention versus control group) are the independent variable in this assessment, and missing appointments and adherence as assessed by medication refills will be the dependent variables for Research Question 2. SPSS will be used for all inferential statistical analyses.

### **Threats to Validity**

It is essential to address threats to validity during the development of a research study. It is understood that various factors could create threats to the study’s validity. Also, there will be questions about the validity, reliability, and generalizability of the data sets and conclusions that can be appropriately reached based on this data. Since the data was retrieved from a primary system where a multidisciplinary team enters all data, missing data may be a significant barrier. If the reported data was inaccurate because of

data entry errors, the conclusions would draw by the statistics. Therefore, missing data was included in the analysis where possible (Goertzen, 2017). SPSS was used to account for most types of missing variables if other information was available for that patient. In a quantitative study of a restricted community like the Veterans, the sample size may be limited, which would also impact generalizability.

### **External Validity**

Threats to external validity include an inherent condition in the research design, which would reduce generalization (Goertzen, 2017) - because the study is limited to veterans in a specific health system, these data will not be generalizable to other communities of veterans, or to other groups of patients with Type II diabetes. Reactive effects, interaction effects due to bias, reactive effects of treatment plans, and multiple treatment interference are considered identifiable treats to external validity (Goertzen, 2017). External validity can be assessed during pre-testing or multiple influenced measurements. During pre-testing interaction, subjects may be sensitized to the effects of the experiment. However, since this study used a secondary data analysis, this was not of concern. Another factor impacting external validity can be the representativeness of the sample, with respect to the target population. If the sample is unrepresented or misrepresented, there would be a limitation in drawing inferences about the population. For the current study, participants were limited to veterans in a single healthcare system, therefore these results weren't generalized to other groups of veterans, or other patients with diabetes. Also, selection bias may have produced a sensitive subject, which was not an issue for this study, as data was retrospective, not prospective. Data was collected

from secondary data sources which have been stored for research use. The experimental setting is also not a concern for this study since this is a quantitative study with secondary data collection. There is no chance of a Hawthorne effect concern.

### **Internal Validity**

Some threats to internal validity concerns include maturity, history, selection bias, testing, and interaction of selections. This study's internal validity is important because good internal validity means that there will be appropriate evidence of the study observation's cause and effect—that the constructs used in the study are meaningful and accurate. In this study, the chance for comparison between the two variables (dependent and independent) is limited since data from the VHA Data Warehouse is well controlled for maturity. Health care providers enter the data as part of their documentation. If incorrect data are entered into the wrong veteran's file, the provider would be alerted to correct the information. The veterans also have access to their medical record; therefore, they could contact the provider to rectify the situation if there is an error identified. The variables are therefore reasonably valid and should have minimal inaccuracy due to the VHA data collection system, and the checks used in that system. Also, survey questions for the patient care alliance team veterans were answered during their initial visit, which eliminates most concerns for data collection fatigue.

### **Construct Validity**

Construct validity measures the quality of choices of the operational forms of the implementation of the independent and dependent variables, and the accuracy of their operational definitions in representing their intended targets. The threats to construct

validity can occur when mono-method bias exists. The VHA data collection system compiled research data from more than one approach; therefore, the intention is to use a combination of data methods to conduct the study should address this bias. Surveys may not be the only source of data that will be collected for this study.

Another threat to construct validity could be that participants anticipate what is needed by the researchers and try to act differently to fit those needs. However, this is not a concern for this quantitative data since all data will be retrieved from the VHA data system warehouse, and as the study is retrospective, this kind of research bias will not be a problem. No live experiment or survey will be conducted for this study. The chosen population will not be able to learn about the program or the study, as data was collected previously. Therefore, expectations of patients cannot positively or negatively alter the results of the surveys or other variables. However, there could be a threat to generalizability across constructs, due to the limited nature of the sample, which will include veterans from one VA Hospital only. For example, there may be instances where treatment affects the variables differently instead of having the same result in all participants.

### **Ethical Procedures**

Since this study will become an official Walden doctoral study, a few steps are needed for approval. Walden, the IRB, and the VHA Data Analysis System must consent to this study. Upon request, and after signing a HIPPA agreement and VHA agreement forms, researchers will have station level access to the Corporate Data Warehouse and the DSS. Having station-level access means that the researcher is cleared to access a more

significant database called the VSSC. This access is highly protected since it will allow the ability to view data from different documenting systems like VHA Systems and Technology and CPRS. It will be essential to protect all participants' identities at all times during data collection and analysis. Therefore, no data will be associated with veterans' names during data collection or data analysis. There will be no conflict of interest since there is no personal relationship between the researcher and the VSSC system administrator. The approval to use secondary data will need to be granted by Walden as well as the IRB.

### **Summary**

In section 2, the applied research methodology for the secondary data that this study will use will be discussed. A general literature review was conducted, and the primary source of this research information was the Walden Library and National Center of Biotechnology Information. Regarding data collection and assessment of data about the veterans, these data will be retrieved from the VHA Health Care System Data Analysis Warehouse. The research design, population of interest, and sampling methods were all discussed in this section. Finally, the study's validity, data analysis, ethical concerns, and other possible considerations were examined. As for the next section, (section 3), the focus will be on presentations of the data, formulating Tables, and showing the potential significance of this kind of research based on the study's research questions.

### Section 3: Presentation of the Results and Findings

The purpose of this quantitative study was to utilize cross-sectional data to determine whether veterans in a Whole Health Program were better at adhering to medication refills and improving their A1c level as opposed to those who not in the Whole Health Program. The examination was guided by the theory of behavioral health change, which indicates that the Whole Health approach can increase psychological well-being, leading to better self-care. The research questions were designed to determine whether there was a difference in A1c levels for veterans receiving a combined treatment of mind–body medicine and pharmacological treatment and those only receiving pharmacological treatment, whether there was a difference in medication adherence between these groups, and the relationship between A1c level and medication adherence for veterans in the Whole Health Program, controlling for gender, age, and co-pay. In Section 3, there are the statistical analysis results (chi-square) on data collected from the national VSSC, Almanac, Corporate Data Warehouse, and DSS. These data are secondary data collected over 2 years. The chi-square test looked for an association between the two groups. The study results subsection includes the chi-square test for each research question (Research Question 1) and (Research Question 2). The conclusion consists of a summary of the results of the research questions.

#### **Accessing the Data Set for Secondary Analysis**

The VSSC is a web-based project application and tracking database. It was used as an access point for data collection of the VHA, Clinical Specific Initiative, and non-recurring maintenance program. The VSSC system contained all data related to the care



given to veterans nationwide. Inside the VSSC system, there were multiple sub-databases such as DSS and Corporate Data Warehouse. To access the DSS and the Corporate Data Warehouse, I requested national access to the VSSC from the federal veteran health administration IT system. Being a VHA employee aided in access to the databases. There were 10,000 synthetic veteran records generated, and the data scope included over 5000 clinical concepts across 90 disease modules (U.S. Department of Veterans Affairs, 2021). The system also contained demographic data, socioeconomic status, and social determinants of health, generally not tracked in the electronic health records. Each U.S. veteran was represented by a synthetic profile where everyone can request access to use them (U.S. Department of Veterans Affairs, 2021). The intention was to collect data dated as far back as 2014; however, the VSSC system only dates back 2 years. The Whole Health Program is also relatively new for data collection; therefore, data were retrieved from 2019–2021 and used to conduct a chi-square analysis of the comparison between the two groups. Secondary data were collected from October 23, 2021, to November 15, 2021. Data reviewed were collected over a period of 2 years from January 2019 to January 2021. Since this was a chart review there was no need for response rate.

### **Discrepancies in the Data Set**

Using the VSSC data set, the clinical data were very concise; however, due to the population, there were some missing data for A1c level and medication renewal adherence of veterans in the Whole Health Program and those who not in program. The Almanac was used to sort out the veterans in the program. These veterans were also seen by the patient care aligned team and each had a nurse care manager and a provider.

### ***Missing data***

Although they did not affect the accuracy of the program, factors such as sealed records, deceased veterans, or those who discontinued the program affected the amount of data collected. Because this missing data can introduce bias leading to a loss of statistical power if not corrected (Osborne, 2013), those veterans were replaced with other veterans in the program who met the criteria. A sample of 128 veterans met the inclusion criteria for this study and were selected out of 138 reviewed charts. Sixty-four veterans in the Whole Health Program were chosen as well as 64 veterans who were not in the program.

## **Descriptive Demographic of the Sample**

### **Age groups**

The plan was to not focus on gender, age, and other demographic factors but on those in the Whole Health Program and those not in the program. These factors were not noted during the data collection. The total sample size was 128, with 64 veterans for each group. Because the veteran population from World War II and Iraq are predominantly male, 122 of the population sampled were male, and six were female. The ages of the males ranged in age from 45 to 80 years old, whereas the females ranged in age from 40 to 70 years old.

### **Medical Diagnosis**

I specifically chose veterans who have diabetes; however, with diabetes came comorbidities. The Whole Health Program requires constant participation, lifestyle changes, and focus on the plan, which could challenge people with other end-stage

diseases (Myrick et al., 2016). The most common comorbidities are hypertension, kidney diseases, dyslipidemia, neuropathy. Veterans with these conditions may also have an uncontrollable A1c level, and they may not be able to adhere to the demands of the Whole Health Program.

### **Representative of the Sample**

For secondary data analysis, after conducting the power calculation, a sample size of 128 veterans was needed to conduct the statistical analysis to compare the two groups. A large sample size was not necessary, but the sample size could not be too small (Andrade, 2020). The inclusion criteria were to have diabetes, male or female, and be a participant in the Whole Health Program. The exclusion criteria were any one no primary care visit in the last 2 years, signed up for the Whole Health Program, but missed three or more visits, and anyone who has been a patient less than 3 years. The VSSC contained hundreds of veterans' data; however, to review a specific number of charts as my sample, I had to use the second system called the Almanac. I would have not had access to the veterans' charts in the Almanac unless I accessed the VSSC. The VSSC contained demographic variables well as medical records of the veterans. For this study, the only focus was on reviewing the charts to find 128 veterans with diabetes who were equally divided among veterans in the Whole Health Program and those who were not. Being a VA employee provided some advantages by minimizing the amount of time it would take to divide the sample. As a Whole Health coach, I had access to the list of the participants who were in the program and those who were not.

### **Chi-square test of Association Sample**

Of the veterans with improved A1c level, 56 were in the Whole Health Program and eight were not. For the veterans with A1c levels that were not improved, eight were in the Whole Health Program and 56 were not. Out of the 64 veterans in the Whole Health Program, 60 renewed their medications, and four did not. Of those veterans not in the Whole Health Program, five renewed their medications, and 59 did not.

### **Study Results**

For Research Question 1, the result indicated that 87.5% of those in the program had an improved A1c level, whereas only 12.5% of the veterans not in the program had an improved A1c level. For Research Question 2, the result indicated 92.3% of the veterans in the Whole Health Program had been adhering to medication renewal as opposed to only 6.3% of those not in the program. This showed that there was statistical significance in A1c levels and medication renewal between veterans in the Whole Health Program and veterans who are not in the program. To account for confounders, a third research question was added; the result indicated there no statistically significant ( $p > 0.05$ ) association between all independent variables (A1c levels and medication adherence). In this subsection, the statistical assumption, and the results of the three research questions will be explained.

### **Research Question 1**

The first research question asked, “Is there was difference in hemoglobin A1c levels in veterans with diabetes receiving combined treatment of mind–body medicine

and pharmacological medicine treatment (in the Whole Health Program) as opposed to receiving only pharmacological treatment (not in the Whole Health Program)?”

### ***Statistical Assumptions***

The data for Research Question 1 was analyzed using Pearson’s Chi-square test for association. There are five assumptions to the Chi-square test such as individual level data, mutually exclusive categories, independence, nominal, or ordinal, mutually exclusive, independent, had cell counts with more than five individuals, and the values must be five or more in 80% of the cells (Schober & Vetter, 2019). This study has met all the assumptions to conduct a Chi-square test of association.

### ***Crosstab and Effect Size Results***

The SPSS statistics represented by the crosstabulation of the two variables of one group in the Whole Health Program and one not in the Whole Health Program and how their A1c level and adherence to the medication renewal were affected. The crosstabulation observation and the expected frequency of each cell is represented in Table 1 indicates significant Chi-square probability values ( $p < 0.05$ ). According to the Crosstab, the 0 Cells (.0%) have expected counts less than 5. The minimum expected count is 32. The Crosstabs Table includes information about observed counts and expected counts. Based on the Crosstabulation table, the expected count was 32 for each group to indicate no improvement; however, the total counts for “yes” for A1c level improved was 56. The A1c level for not improved was 8 for those in the Whole Health Program. Inversely for the count for “no”, for those not in the Whole Health Program the A1c level improved was 56 and 8 for no A1c level improvement, and the expected count

was 32 for both groups. The total expected count was 128 total with 64 represented in the Whole Health Program and 64 who are not in the program. Therefore, it is determined that the counts were equal to the expected counts. The magnitude of the effect size based on the Cramer's  $V$  or  $\phi$  coefficients ranged from 0.750 to 0.750. Based on the effect size analysis, all the significant Chi-square value results had a meaningful difference, and will reject the null hypothesis (Hilton et al., 2014).

**Table 1**

*A1c level improved (1 or 2) \* Vet with DM and Not in the WH Program Crosstabulation*

		Vet with DM and Not in the WH Program			
		Not In the WH Program	In the WH Program	Total	
A1c level improved (1 or 2)	yes	Count	8	56	64
		Expected Count	32.0	32.0	64.0
		% Within A1c level improved (1 or 2)	12.5%	87.5%	100.0%
	no	Count	56	8	64
		Expected Count	32.0	32.0	64.0
		% Within A1c level improved (1 or 2)	87.5%	12.5%	100.0%
Total		Count	64	64	128
		Expected Count	64.0	64.0	128.0
		% Within A1c level improved (1 or 2)	50.0%	50.0%	100.0%

### ***Hypothesis Test Results***

The result indicated a statistically significant ( $p < 0.05$ ) association between all independent variables. According to the test result, the observed frequency was as expected higher for veterans with DM and in the Whole Health Program than for those not in the Whole Health Program which led to prove that there is an association between the variables. Based on the 2x2 crosstabulation which indicated a dichotomous variable

where they are only two categories, I choose to use the Pearson Chi-square test result for association. I also choose Pearson Chi-square to test the result because it is already established in the assumption section that if all expected cell frequencies are greater than five, it is preferable to use the Chi-square test for association (Hilton, et al., 2014). As shown, the statistical significance value of  $p$ -value was 0.000; therefore, ( $p = 0.000$ ). Thus,  $p$  is less than 0.05, ( $p < 0.05$ ) which indicates a statistically significant result. This result also indicated a statistically significant association between the two dichotomous variables.

The result of the hypothesis test and effect sizes analyses showed significant associations. I conducted a Chi-square test between the two groups such as those in the Whole Health Program and those who are not in the Whole Health Program for improvement of A1c level. The expected cell frequencies were greater than five, and there were statistically significant of association between them,  $\chi^2 (1) = 72.000$ ,  $p = 0.000$ ; therefore, each variables showed a meaningful effect size as A1c ( $\chi^2 = 72.000^a$ ,  $p < 0.001$ ) the Pearson's Chi Square analysis indicated in Table 2 that there is a need for further analysis as addressed in Research Question 2.

**Table 2***Chi-Square Test for Research Question 2*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1-sided)
Pearson Chi-square	72.000 <sup>a</sup>	1	.000		
Continuity Correction <sup>b</sup>	69.031	1	.000		
Likelihood Ratio	80.993	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	71.438	1	.000		
N of Valid Cases	128				

*Note.* a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 32.00.

b. Computed only for a 2x2 Table

**Research Question 2**

The second Research Question asked is there a difference in adhering to medication renewal in veterans with diabetes receiving combined treatment of mind-body medicine and pharmacological medicine treatment (in the Whole Health Program) as opposed to receiving only pharmacological treatment (not in the Whole Health Program)?

***Statistical Assumptions***

The data for Research Question 2 was analyzed using Pearson's Chi-square test for association. As mentioned above, there are five assumptions to the Chi-square test such as individual level data, mutually exclusive categories, independence, nominal, or ordinal, mutually exclusive, independent, had cell counts with more than five individuals, and the values must be five or more in 80% of the cells (Schober & Vetter, 2019). This study has met all the assumptions to conduct a Chi-square test of association.



### *Crosstab and Effect Size Results*

The SPSS statistics represented by the crosstabulation of the two variables of one group in the Whole Health Program and one not in the Whole Health Program, and how adherence to the medication renewal is affected. The crosstabulation observation and the expected frequency of each cell as represented in Table 3 indicated significant Chi-square probability values ( $p < 0.05$ ). According to the Crosstab, the 0 Cells (.0%) have expected counts less than 5. The minimum expected count is 32. The crosstabs table included information about observed counts and expected counts. Based on the crosstabulation table, the expected count was 32.5 for each group to indicate no improvement for a total count of 64; however, the total counts for “yes” for adhering to medication improved was 60, and not adhering to medication 4 for those in the Whole Health Program. Inversely for the count for “no,” for those not in the Whole Health Program the number adhering to medication was 5, and 59 for no adherence to medication renewal, and the expected count was 32 both ways. The total expected count was 128 total with 64 represented those in the Whole Health Program and 64 who were not in the program. Therefore, the counts were equal to the expected counts. The magnitude of the effect size based on the Cramer’s V or  $\phi$  coefficients ranged from 0.859 to 0.859. Based on the effect size analysis, all of the significant Chi-square value results of  $p = 0.000$ , had a meaningful difference, and will reject the null hypothesis (Hilton et al., 2014).

**Table 3**

*Adhering to Medication Renewal FY 2019 to FY 2021 \* Vet with DM and Not in the WH Program Crosstabulation*

			Vet with DM and Not in the WH Program		
			Not In the WH Program	In the WH Program	Total
Adhering to Medication Renewal FY 2019 to FY 2021	yes	Count	5	60	65
		Expected Count	32.5	32.5	65.0
		% Within Adhering to Medication Renewal FY 2019 to FY 2021	7.7%	92.3%	100.0%
	no	Count	59	4	63
		Expected Count	31.5	31.5	63.0
		% Within Adhering to Medication Renewal FY 2019 to FY 2021	93.7%	6.3%	100.0%
Total		Count	64	64	128
		Expected Count	64.0	64.0	128.0
		% Within Adhering to Medication Renewal FY 2019 to FY 2021	50.0%	50.0%	100.0%

### ***Hypothesis Test Results***

For Research Question 2, the result also indicated a statistically significant ( $p < 0.05$ ) association between all independent variables. In the test result, the observed frequency was as expected higher for veterans with DM and in the Whole Health Program, and lower for those not in the Whole Health Program. Therefore, the result proved that there was an association between the variables. The 2x2 crosstabulation indicated a dichotomous variable where there are only two categories. I used the Pearson Chi-square test result for association. I also used Pearson Chi-square to test the result because it is already established in the assumption section that if all expected cell frequencies are greater than five. For cell frequency greater than five, it is preferable to use the Chi-square test for association (Hilton et al., 2014). As shown, the statistical significance value of  $p$ -value is 0.00; therefore,  $p$  is less than 0.05, ( $p < 0.05$ ) which indicated a statistically significant result. Once again, the Research Question 2 test result also indicated a statistically significant association between the two dichotomous variables.

The result of the hypothesis test and effect sizes analyses showed significant associations. I conducted a Chi-square test between the two groups such as those in the Whole Health Program and those who are not in the Whole Health Program for adhering to medication renewal. The expected cell frequencies were greater than five, and there were statistically significant of association between them,  $\chi^2 (1) = 94.554a, p = 0.000$ ; therefore, for each variables showed a meaningful effect size as adhering to medication renewal ( $\chi^2 = 94.554a, p < 0.001$ ) the Pearson's Chi Square analysis indicates in Table 4.

**Table 4***Chi-Square Test for Research Question 2*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1-sided)
Pearson Chi-square	94.554 <sup>a</sup>	1	.000		
Continuity Correction <sup>b</sup>	91.147	1	.000		
Likelihood Ratio	112.396	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	93.816	1	.000		
N of Valid Cases	128				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 31.50.

b. Computed only for a 2x2 Table

**Research Question 3**

The third Research Question asked for the relationship between AIC and medication adherence in veterans with diabetes participating in the Whole Health Program, controlling for gender, age, and co-pay.

***Statistical Assumptions***

The data for Research Question 3 was analyzed using multiple logistic regression test for the relationship between the predictors. There are six assumptions based on the logistic regression methodology. These assumptions are a) binary or ordinal dependent variable, b) a factor of one is the desired outcome, c) model should be fitted correctly, d) error terms need to be sample size, e) linearity of independent variables and log odds, f) dataset has a large sample size. Based on the assumptions, the rules for logistic regression are met (Plonsky & Ghanbar, 2018). The Cox & Snell R Square is  $R^2 = .684$  cases. The multivariate adjustment for logistic regression the Nagelkerke's  $R^2 = .912$

indicted 95% cases, and non-significant Hosmer and Lemeshow's test for model fit ( $p = .829$ ), which suggests the model does not fit using  $p < .05$ .

### ***Classification Table***

After adding the predictors, this table indicates how well the model is able to predict the correct category. 95% of the cases are correctly classified according to the classification table (Table 5). Which indicates how well the independent variable is able to predict the dependent variables categories. The predicted specificity and sensitivity, in this case, are equal; therefore, the negative rate and the positive rate for this model are both 95% of cases observed to fall in the target group.

**Table 5**

### ***Classification Table<sup>a</sup>***

		Predicted			Percentage Correct
		In the Whole Health Program (yes 0, No 1)			
Step 1	Observed	Yes	No		
		In the Whole Health Program (yes 0, No 1)	Yes	61	3
		No	3	61	95.3
	Overall Percentage				95.3

a. The cut value is .500

### ***Hypothesis Test Result***

For Research Question 3, the result also indicated there is no statistically significant ( $p > 0.05$ ) association between all independent variables, Hemoglobin A1c, and Medication adherence. In the test result, the observed frequency was as expected to be lower for veterans with DM and in or not in the Whole Health Program based on age and gender. Therefore, the result proved that there was no relationship between the

control factors, gender, age, co-pay. If weight is in effect, the number of cases observed was 128 with zero missing cases. The categorical variables coding Table 6 indicates that the categories were 122 male and six females.

**Table 6**

*Categorical Variables Coding*

		Frequency	Parameter coding (1)
Gender	Female	6	.000
	Male	122	1.000
Adhering to medication renewal (yes 1, No 2)	1	65	.000
	2	63	1.000
A1c improve	A1c Improved	64	.000
	A1c did not improve	64	1.000

After statistically adjusting for the gender, age, and co-pay, I could not find statistically significant with the assumption that there was a relationship between A1C and medication adherence in veterans with diabetes participating in the Whole Health Program, controlling for gender, age, and co-pay. There was no statistically significant association between A1c, medication adherence, age, gender, and co-pay. Table 7 shows the relationship between the predictors and the outcome. The variables and the equation indicated a decreased likelihood of a relationship based on a negative value for P/B = -20.663; SE 3882.129 and Sig of P = .996 for A1c level improvement. As for adhering to medication renewal, P/B = -22.053, SE 3882.129, and Sig of P = .995, the same indication was made. However, for gender, which is on the positive side, there is an increased likelihood of a relationship, P/B = 1.364, SE 1.331, Sig. P = .306. In this model, the

probability of falling into the target group is equal to that of the non-target group, as indicated by the odds ratio of 1.

**Table 7**

*Variables in the Equation*

	B	SE	Wald	Df	Sig.	Exp(B)
Step 1 <sup>a</sup> A1c improve (1)	-20.663	3882.129	.000	1	.996	.000
Adhering to medication renewal (yes 1, No 2) (1)	-22.053	3882.129	.000	1	.995	.000
Gender (1)	1.364	1.331	1.050	1	.306	3.910
Age	-.071	.062	1.326	1	.249	.931
Constant	24.072	3882.130	.000	1	.995	2846337 3809.422

a. Variable(s) entered on step 1: A1c improve, Adhering to medication renewal (yes 1, No 2), Gender, Age.

### Summary

Section 3 explained the results and the findings of the research study. This section was composed of the study purpose, data collection diagram, the descriptive statistics, inferential statistics of hypotheses, the research questions, and the study's key findings. To conduct the study, I examined data collected from 2019 to 2021 from the VSSC located in the Almanac, a data software for the VHA. This secondary analysis studied the relationship between veterans who have been in the Whole Health Program compared to those never enrolled in the Whole Health Program. To determine if there was a significant difference between the two groups, the dependent variables of A1c levels and adherence to medication renewal were analyzed. During the study, confounding variables such as gender, and aging, cost, and co-pay were considered and (which may interfere

with adhering to medication renewals). A Multivariate logistic regression analysis was conducted, and showed no relation between participants A1c levels, adherence to medication renewal, gender, age, and co-pay.

Based on the significant result of the probability values and the meaning of the effect sizes such as A1c levels when or when not in the Whole Health Program and adhering to medication renewal when or when not in the Whole Health Program indicated the need for further analysis. Each probability was investigated using the Chi-square test for association for both research questions. The results indicated significant improvement for those in the Whole Health Program. After adjusting the sample size to meet the criteria for the study and removing those with any missing values,  $n = 64$  veterans in the program and  $n = 64$  veterans not in the program for a total mean,  $n = 128$  samples. It was implied that veterans manage their diabetes better when they were in the Whole Health Program as opposed to when they were not. The interpretation of the findings for this doctoral study is presented in Section 4. That section served as an overview of this study's interpretations, limitations, recommendations, and conclusions. The finding will also highlight the relevant literature and the theoretical framework, which in this case is the theory of behavioral health change.



#### Section 4: Application to Professional Practice and Implications for Social Change

The purpose of this research was to determine the association between veterans in the Whole Health Program and those who were not regarding management of their type 2 diabetes. A total of 128 veteran charts were reviewed, and the samples were divided into two equal groups—of 64 in the Whole Health Program, and 64 who had not been participating in the program. The two groups were compared using the chi-square test for the association of crosstabulation since the variables were both nominals.

#### **Interpretation of Findings**

The analysis showed a significant association between the veterans who have been part of the peer-to-peer support Whole Health Program and a decrease in their A1c levels and medication renewal. A literature review also confirmed that the Whole Health peer pathway has helped veterans with type 2 diabetes improve self-care and quality of life. The theory of health behavior change also supports this claim, as it emphasizes that knowledge and beliefs could influence health by promoting self-management and self-care (Ryan, 2009). The number of veterans with an improved A1c level and improved adherence to medication renewal were observed to confirm these two claims. In conclusion, the study accepted the null hypothesis for both research questions.

#### **Findings Related to the Literature**

During the study, I noted a few pieces of literature that supported the Whole Health Program. Although the program is a reasonably new approach, a study was conducted in 2009 by Song et al. that indicated that when subjects engage in a self-care program like the Whole Health Program, it creates additional benefits for patients. In

another study by Whitebird et al. (2018), the researchers suggested that mind–body medicine, which combines treatment of whole health and pharmacological treatment, promotes self-management by using mindfulness techniques. There is no one method of mind–body medicine, but the idea is to support one another in the program and measure the individual’s success (Whitebird et al., 2018). Further, mindfulness is a powerful way to promote self-care, which is the Whole Health Program’s focus. Finally, though there were limited resources that that measured medication adherence and the Whole Health Program, researchers have concluded that poor medication adherence among diabetes patients is associated with poor treatment outcomes and progression of disease symptoms and complications (Zullig et al., 2015).

### **Research Question 1 Related to the Theoretical Foundation**

Research Question 1 answered whether the probability of veterans with type 2 diabetes showed an improvement of their A1c level when they were a participant of the Whole Health Program in combination with pharmacological treatments. I analyzed 2 years of data with a chi-square analysis, which showed a significance between the A1c levels of the groups. Improving A1c levels is a challenge for all patients with diabetes; however, slight lifestyle changes can help maintain or decrease the A1c level for those with type 2 diabetes. As mentioned, the theory of health behavior changes focuses on knowledge and beliefs, self-regulation skill and ability, and social facilitation. Peer-to-peer support is a big component of behavior health change. Researchers have stressed that both health care practitioners and future interventions must focus on programs that promote individual self-care behaviors. For those with diabetes, this approach helped

them improve and control their glycemic index (Soto et al., 2015). Thus, the Whole Health Program promotes high levels of self-support, which is associated with knowledge of their condition and the benefits of lifestyle changes.

### **Research Question 2 Related to the Theoretical Foundation**

Research Question 2 was to answer whether the probability of veterans with type 2 diabetes showed an improvement of their adherence to medication renewals when they were a participant of the Whole Health Program in combination with pharmacological treatments. The same 128 veteran charts were used, except the data reviewed reflected veterans' pharmacological treatment. Again, the findings revealed that the veterans participating in the program were more likely to adhere to renewing their medication timely. In relation to the theory of health behavior change, patients would be motivated to adhere to medication renewal when they are knowledgeable about the disease process and how to maintain a healthy lifestyle even after being diagnosed. Based on the results of the study, a program that focuses on using the theory of behavior health can promote consistency, self-care, and peer-to-peer support (Penn et al., 2013). Knowledge and benefits that would lead to self-regulation skills and ability and social facilitation all need to be considered when thinking of self-engagement.

### **Research Question 3 Related to the Theoretical Foundation**

The control factors available to me, including co-pay, were not associated with the behavioral health change theory; however, gender and age may have some relationship with peer-to-peer support. Most veterans are male, some share the same age group, and they relate and share their similar experiences, which according to the

behavior health theory, is part of social facilitation. The behavior health theory focuses on peer-to-peer support to promote behavior change to improve well-being and engagement (Penn et al., 2013). Other factors such as race, weight, physical activity, and insurance may be associated; however, these factors were not available in these data sets.

### **Limitations of the Study**

Many challenges were present while conducting this study. Being a secondary data collection was a limitation because there was no opportunity to interview the participants. Data were collected using a database from the VHA system. The data were collected by reviewing veterans' charts of how many of them improved their A1c levels and how many of them adhered to medication renewals while they were or were not in the Whole Health Program. Secondary data must be able to respond to each study question after the analysis is done. When using secondary data, researchers must be familiar with the data, understand the methods of collection, the response category for each question to be applied, and account for clusters and stratification (Cheng &Phillips, 2014). The limitation of a study impacts the generalizability, validity, and reliability of its findings. Data source and data quality differ based on their collection method (Simmonds et al., 2020).

For this study, I only collected data from the VHA, the central system called VSSC, which is a web-based project application and tracking system for all Veteran Affairs. As explained in section 3, it is a trusting access point for collecting all veterans' records. The likelihood of these records being invalid is very small, as health care workers enter them into a first system called CPRS during hospital visits and they are

screened before being transferred to be stored in VSSC. Veterans also have access to their health records. Therefore, they can convey any incorrect information in their record, if any, to their health care provider or medical record department. There were no missing data since the database contains over 10 thousand charts. I was able to replace any chart with missing data with another chart. The data collected were reliable and easy to manage. Statistical data are only as good as the quality of reported data (Osborne, 2013). The control factors that were available to me were gender, age, co-pay. Other factors such as race, weight physical activity, and insurance may be associated; however, these factors were not available in these data sets. While the data collected were valid, reliable, and trustworthy, there were many difficulties obtaining access to the system.

As a government employee, national-level clearance was needed to access the system. When I started the study, it seemed to be an easy task to have the access I needed because I was working for the Veteran Hospital in Miami. In 2019, I transferred to the San Francisco VA, and that is when I realized to collect information about veterans in the Miami VA, I needed to have national-level access to the VSSC. That process lasted over one year because the guidance I needed to understand what I needed to do was not available. Obtaining IRB approval was another stressor, but thanks to my current supervisors, they could help me get permission to get IRB approval. This explanation is relevant to my limitations because the intent was to collect data for the past eight years; however, these data were no longer available due to the delay. The only available data were from 2019 to 2021.

Based on the result of this study, the sample size was large enough, as evidenced by the effect size in the unadjusted Cramer's V analysis. Additionally, the Whole Health Program is relatively new; therefore, I could have still had issues collecting data for eight years past. When the program started to be robust at the Miami VHA, it was only 2018, 2019. Therefore, any data before those years could be invalid due to lack of documentation. Although there were a few limitations with this study, it would be better to conduct the study in the actual VA where the researcher is currently working, and there will be no need for national access. When accessing a local entry in the VSSC, more data are available, and the access earned is granted for a more extended period.

### **Recommendations**

The first recommendation is to have this study replicated for future research since there may not have had enough study to promote the Whole Health Program. It would also help conduct both quantitative and qualitative research studies where researchers can interview the participants and have more information to strengthen the hypothesis. The subsequent research would have focused interviews of multiple focus groups to facilitate the analysis. Interviewing the participants would provide a closer analysis since it would be more descriptive of their experience and how they felt about the program. The data collected would help the researcher to have a broader idea on how to pursue further relevant data collection for the study (Cheng et al., 2014). Conducting both secondary and primary data collection would benefit this type of study better as it will give researchers a better perspective of the importance of spreading the program. During the literature review in section 1, many studies discussed how to diagnosis and manage type

two diabetes; however, there is not enough study to promote Whole Health as the best option to help with self-care. Song et al. (2009) conducted a study that indicated that participants in the Whole Health Program were encouraged to participate in better self-care and exercise programs. Whitebird et al. (2018) also agreed that managing diabetes is a challenge, but the Whole Health Program can help veterans improve compliance and promote self-care.

Another recommendation would be to focus on a broader range of data such as age, gender, demographic, and socioeconomic status of the samples of the private sector. This study focused on Military personnel, which is excellent. Still, it would be wise to see if the civilian sector also practices Whole Health Peer Pathway with pharmacological medicine. The limitation of gathering data from the VA makes it harder for researchers to collect these data; therefore, spreading the study to the public sector (civilian) would be beneficial. Based on research, it seems that the private sector has slowly been introduced to the Whole Health Peer Pathways. According to Raghebian et al. (2015), mindfulness could help with self-control and improve A1c levels in type 2 diabetes patients. It seems that researchers are aware of the benefits of the program; however, finding studies that focused on gender, age, and demographics were not so accessible.

### **Implications for Professional Practice and Social Change**

This section provides recommendations to professional practice and positive social change implications relevant to Whole Health Peer Pathways in combination with pharmacological treatment for people with type 2 diabetes. As it is known, diabetes is a severe health issue and is also associated with many comorbidities (Center for Disease

Control and Prevention, 2019). The VA has been using the Whole Health Program for veterans with mental health issues; however, the Whole Health Peer Pathways can also provide many opportunities for the diabetic population, as mentioned in the study.

### **Professional Practice**

As a healthcare professional and researcher, I am leading this investigation to be an excellent exploratory examination for spreading the importance of engaging the diabetic population in the Whole Health Peer Pathways. I am suggesting the methodological and the theoretical applications to health care professionals for the reasons stated below.

### **Methodological**

There are many methods to obtain a factor analysis to prove this hypothesis; however, I decided to research the physical A1c value of the veterans and their medication adherence with the given data. Designing a study is not only an object of the study, but it is also the means to carry out the study (Roggema, 2017). As for this study, the method used was to find a response of yes or no whether the Whole health program worked or not. Given that this is a new program, these data were more accessible and available, and the analysis of the study was able to accept the hypothesis. It means that the study agreed that the veterans in the Whole Health Program were doing much better in keeping their A1c level down and showing more adherence to medication renewal than veterans not in the program. It would also help future studies to use other variables such as the actual variation in A1c levels from the start of the program to the end of the program to note the actual numbers of the A1c and measure the trends. Using quantitative



data of those in the program would provide a better understanding of how well the program worked in lowering the A1c level.

### **Theoretical**

The theoretical implications for this study were to look at whether or not participating in the Whole Health Peer Pathways program could increase veterans' medication adherence and lower their hemoglobin A1c levels. This study showed that participating in the program had a positive effect on the medication adherence and hemoglobin A1c levels of the veterans in the program, as indicated by the Theory of Behavioral Health Change. In this subsection, I encourage health care professionals to look at the Theory of Behavioral Health Change to understand how the Whole Health Program can help change many lives of those who have diabetes.

### **Positive Social Change**

Understanding the rising cost, contributing factors, and challenges associated with diabetes and its comorbidities, the Whole Health Program combined with pharmacological treatment would be the best approach to promote a better life for those with diabetes. I aim to use the results of the study to spread the word and create initiatives to raise awareness of the Whole Health Peer Pathway combined with pharmacological treatment benefits. This study suggests that the VHA has started a great initiative to help the veterans obtain optimal self-care at an individual level. It also means that society should embrace the Whole Health Peer Pathways to promote better care and health for future generations. The current plan is to encourage modalities based on theories, methods, and training to create a knowledge base for the next generation to improve

community health (National Academies of Sciences, Engineering, & Medicine, 2017). It is understood that there were other political and socioeconomic factors associated with the spreading of the Whole Health Peer Pathways. Still, today insurance companies have learned about the benefit of promoting self-care and peer support. Insurance Company's believe that education alone cannot help those with diabetes; therefore, they recommended that health care professionals find a newer and better approach to help those with diabetes adhere to a treatment plan (Horigan et al., 2016). Some insurance companies have been advocating and paying for some of those modalities, such as group support, Tai-chi, yoga, acupuncture, and more. I might say that cost-effectiveness interests them; however, I would say it is about time for insurance companies to promote preventive medicine. I understand that there are those without insurance or struggling to make their co-pay. Therefore, I am hoping for government entities such as community clinics, states hospitals to take the stand and follow the footsteps of the VHA.

### **Conclusion**

I studied the charts of over 128 veterans with diabetes in which I selected a total of 128 charts based on the G\* power calculation. I identified the relationship between those with diabetes taking part in the Whole Health Program and those with diabetes but not participating in the Whole Health Program. I used the VSSC data storage system to collect my data for this study. This investigation was a yes or no study based on findings from charts review. I used SPSS to conduct a Chi-square test of the data. The data reflected the improvement of veterans' A1c level from 2019 to 2021 for the first question.

The study also considered the possible confounders, such as other medical diagnoses affecting the veterans' A1c levels. The second question reflected the number of times veterans adhered to refill their medications. The study also accounted for the opportunity for confounders since there could have been other reasons besides nonadherence that veterans were not renewing their prescription, such as side effects or cost of the medications. The current state of healthcare due to COVID-19 for example and other airborne communicable variants have taken some of the focus away from primary diseases such as diabetes, hypertension, heart diseases, and more. These crises are telling us that we need new approaches to healthcare. We need to train the people to learn how to provide self-care, manage manageable conditions, and prevent preventable diseases. The pandemic of obesity and diabetes is almost invisible to healthcare professionals today since this new face-covering disease is taking over the world (Langevin, 2021). Supporting the whole mind, body, and spirit are what the Whole Health Peer Pathways conveyed to the population while providing the necessary support to keep grounded in self-care (Langevin, 2021). This study also used the Behavioral Health Theory of Change to show that the Whole Health Program works. This study result enhanced the understanding that health and well-being relied on multiple domains such as biological, social, behavioral, and environmental (Langevin, 2021). I suggest that the Veterans' hospital clinicians and all healthcare professionals take the stand and embrace the fact that Whole Health is the best way to start changing the way people use healthcare and help those with diabetes take charge of their health.

## References

- American Diabetes Association. (2020). Comprehensive medical evaluation and assessment of comorbidities: Standards of medical care in diabetes-2020. *American Diabetes Association*, 43(suppl 1), 37–47. <https://doi.org/10.2337/dc20-S004>
- Andrade, C. (2020). Sample Size and its Importance in Research. *Indian Journal of Psychological Medicine*, 42(1), 102–103. [doi.org/10.4103/IJPSYM.IJPSYM\\_504\\_19](https://doi.org/10.4103/IJPSYM.IJPSYM_504_19)
- Cheng, H. G., & Phillips, M. R. (2014). Secondary analysis of existing data: opportunities and implementation. *Shanghai Archives of Psychiatry*, 26(6), 371–375. <https://doi.org/10.11919/j.issn.1002-0829.214171>
- Center for Disease Control and Prevention. (2019). Division of diabetes translation. <https://www.cdc.gov/chronicdisease/pdf/aag/ddt-H.pdf>
- Denneson, L. M., Trevino, A. Y., Kenyon, E. A., Ono, S. S., Pfeiffer, P. N., & Dobscha, S. K. (2019). Health coaching to enhance psychological well-being among veterans with suicidal ideation: A pilot study. *Journal of General Internal Medicine*, 34(2), 192–194. <https://doi.org/10.1007/s11606-018-4677-2>
- DiNardo, M., Saba, S., Greco, M. C. (2017). Mindful approach to diabetes self-management education and support for veterans show all authors. *PubMed*, 51(2), 109–127. <https://doi.org/10.1177/0145721717738019>
- Gray, K. E., Hoerster, K. D., Reiber, G. E., Bastian, L. A., & Nelson, K. M. (2019). Multiple domains of social support are associated with diabetes self-management

among veterans. *Chronic Illness*, 15(4), 264–275.

<https://doi.org/10.1177/1742395318763489>

Goertzen, J. M. (2017). Introduction to qualitative research and data. *Library Technology Report*, 53(4), 140–141. <https://doi.org/10.4135/9781473992290>

Hinton, P., McMurray, I., & Brownlow, C. (2014). *SPSS explained*. Routledge.

<https://doi.org/10.4324/9781315797298>

Hull, A., Holliday, S. B., Eickhoff, C., Rose-Boyce, M., Sullivan, P., & Reinhard, M.

(2015). The integrative health and wellness program: Development and use of a complementary and alternative medicine clinic for veterans. *Alternative Therapies in Health & Medicine*, 21(6), 12–21.

Lanhers, C., Duclos, M., Guttman, A., Coudeyre, E., Pereira, B., & Ouchchane, L.

(2015). General practitioners' barriers to prescribe physical activity: The dark side of the cluster effects on the physical activity of their type 2 diabetes patients.

*PLoS ONE*, 10(10), 1–12. <https://doi.org/10.1371/journal.pone.0140429>

Langevin, H. M. (2021). Moving the complementary and integrative health research field toward whole person health. *The Journal of Alternative and Complementary Medicine*, 27(8), 623–626. <https://doi.org/10.1089/acm.2021.0255>

Lee, S., Bae-Shaaw, Y. H., Gogineni, H., Worley, M. M., & Law, A. V. (2019). Triple strength utility of the modified drug adherence work-up (M-DRAW) tool in a veterans affairs outpatient diabetes clinic. *Research in Social and Administrative Pharmacy*, 16(7), 914–920. <https://doi.org/10.1016/j.sapharm.2019.09.063>

Moin, T., Damschroder, L. J., AuYoung, M., Maciejewski, M. L., Datta, S. K., Weinreb,

- J. E., Steinle, N. I., Billington, C., Hughes, M., Makki, F., Holleman, R. G., Kim, H. M., Jeffreys, A. S., Kinsinger, L. S., Burns, J. A., & Richardson, C. R. (2017). Diabetes prevention program translation in the Veterans health administration. *American Journal of Preventive Medicine*, *53*(1), 70–77.  
<https://doi.org/10.1016/j.amepre.2016.11.009>
- Moser, A., & Korstjens, I. (2018). Sampling, data collection and analysis. *The European Journal of General Practice*, *24*(1), 9–18.  
<https://doi.org/10.1080/13814788.2017.1375091>
- Myrick, K., & del Vecchio, P. (2016). Peer support services in the behavioral healthcare workforce: state of the field. *Psychiatric Rehabilitation Journal*, *39*(3), 197–203.  
<https://doi.org/10.1037/prj0000188>
- National Academies of Sciences, Engineering, and Medicine. (2017). Communities in action: Pathways to health equity. <https://pubmed.ncbi.nlm.nih.gov/28418632/>
- Osborne, J. S. (2013). *Best practices in data cleaning*. Sage.
- Polonsky, W. H., & Henry, R. R. (2016). Poor medication adherence in type 2 diabetes: Recognizing the scope of the problem and its key contributors. *Patient preference and Adherence*, *10*, 1299–1307. <https://doi.org/10.2147/PPA.S106821>
- Plonsky, L., & Ghanbar, H. (2018). Multiple regression in L2 research: A methodological synthesis and guide to interpreting R2 values. *The Modern Language Journal*, *102*(4), 713–731. [doi.org/10.1111/modl.12509](https://doi.org/10.1111/modl.12509)
- Raghebian, M., Nasireian, M., Zarch, K. (2015). The effectiveness of group training of mindfulness on quality of life in type 2 diabetic patients. *Iranian Journal of*

*Diabetes and Obesity*, 7(1). <https://ijdo.ssu.ac.ir/article-1-228-en.pdf>

Roggema, R. (2017). Research by design: Proposition for a methodological approach.

*Urban science*, 1(1), 2. [doi.org/10.3390/urbansci1010002](https://doi.org/10.3390/urbansci1010002)

Ryan, P. (2009). Integrated theory of health behavior change: background and

intervention development. *Clinical nurse specialist CNS*, 23(3), 161–172.

[doi.org/10.1097/NUR.0b013e3181a42373](https://doi.org/10.1097/NUR.0b013e3181a42373)

Penn, L., Dombrowski, S. U., Sniehotta, F. F., & White, M. (2013). Participants'

perspectives on making and maintaining behavioral changes in a lifestyle

intervention for type 2 diabetes prevention: a qualitative study using the theory

domain framework. *BMJ open*, 3(6), e002949. [doi:10.1136/bmjopen-2013-](https://doi.org/10.1136/bmjopen-2013-002949)

[002949](https://doi.org/10.1136/bmjopen-2013-002949)

Schober, P., & Vetter, T. R. (2019). Chi-square tests in medical research. *Anesthesia &*

*Analgesia*, 129(5), 1193. [doi: 10.1213/ANE.00000000000004410](https://doi.org/10.1213/ANE.00000000000004410)

Simmonds, E. G., Jarvis, S. G., Henrys, P. A., Isaac, N. J., & O'Hara, R. B. (2020). Is

more data always better? A simulation study of benefits and limitations of

integrated distribution models. *Ecography*, 43(10), 1413-1422.

[doi.org/10.1111/ecog.05146](https://doi.org/10.1111/ecog.05146)

Simmons, L. A., Drake, C. D., Gaudet, T. W., & Snyderman, R. (2016). Personalized

health planning in primary care settings. *Federal practitioner: for the health care*

professionals of the VA, DoD, and PHS, 33(1), 27–34.

Sylvia, M. L., & Zuccarini, M. (2014). *Clinical analytics and data management for the*

DNP. New York: Springer Publishing Company. Retrieved from

- Song, R., Ahn, S., Roberts, B., Lee, E., & Ahn, Y. (2009). Adhering to a tai chi program to improve glucose control and quality of life for individuals with type 2 diabetes. *Journal of Alternative & Complementary Medicine*, 15(6), 627-632.  
doi:10.1089/acm.2008.0330
- Soto, S. C., Louie, S. Y., Cherrington, A. L., Parada, H., Horton, L. A., & Ayala, G. X. (2015). An ecological perspective on diabetes self-care support, self-management behaviors, and hemoglobin A1C among Latinos. *The Diabetes Educator*, 41(2), 214-223. doi.10.1177/0145721715569078
- Sukhee, A., and Rhayun, Song. (2012). *Journal of Alternative and Complementary Medicine*. New York, N.Y, 18(12):1172-1178. DOI: 10.1089/acm.2011.0690
- Taylor, S. L., Hoggatt, K. J., & Kligler, B. (2019). Complementary and integrated health approaches: what do Veterans use and want. *JGIM: Journal of General Internal Medicine*, 34(7), 1192.
- Tucker, S. J., Tiegreen, W., Toole, J., Banathy, J., Mulloy, D., & Swarbrick, M. (2013). *Supervisor Guide: Peer Support Whole Health and Wellness Coach*. Decatur, GA: Georgia Mental Health Consumer
- Weng, W., Liang, Y., Kimball, E., Hobbs, T., & Kong, S. (2018). Trends in comorbidity burden and treatment patterns in type 2 diabetes: Longitudinal data from a US cohort from 2006 to 2014. *Diabetes Research and Clinical Practice*, 142, 345–352. <https://doi- /10.1016/j.diabres.2018.05.031>
- Wolever, R. Q., Dreusicke M., Fikkan J., Hawkins T. V., Yeung S., Wakefield J., Duda L., Flowers P., Cook C., Skinner E. (2010). *Integrative Health Coaching for*



patients with type 2 diabetes: A Randomized Clinical Trial. *The Diabetes Educator*, 36(4), 629–639. doi- /10.1177/0145721710371523

Zullig, L. L., Gellad, W. F., Moaddeb, J., Crowley, M. J., Shrank, W., Granger, B. B., Granger, C. B., Trygstad, T., Liu, L. Z., & Bosworth, H. B. (2015). Improving diabetes medication adherence: successful, scalable interventions. *Patient preference and adherence*, 9, 139–149. <https://doi.org/10.2147/PPA.S69651>

Veazie, P. (2015). *Understanding Statistical Testing*. Sage journal, 1-9.  
[doi.org/10.1177/2158244014567685](https://doi.org/10.1177/2158244014567685)