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Marketplace Clinics Complementing Community-Based Diabetes Care for Urban Residing American Indians

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This is to certify that the doctoral dissertation by

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2015

Abstract

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Robert Rick

MPH, University of Minnesota, 1976

BSIE, North Dakota State University, 1967

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Health Services Management and Policy

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Abstract

The American Indians population in Minneapolis, Minnesota has experienced limited health care access and threefold diabetes health disparity. The purpose of this study was to measure the extent to which collaborating marketplace clinics and community-based support groups expanded diabetes care and provided self-management education for this largely urban Indian neighborhood. The marketplace clinics located in nearby CVS, Walmart, Target, and Supervalu stores committed financial support, certified educators, and pharmacy staff for the community-based support group. The study was conducted within the patient activation measure (PAM) analytical framework to assess the participants' acquired knowledge, skills, and confidence for diabetes self-management. A case-control study and 3 years retrospective analysis of secondary data were used to test whether the Minneapolis marketplace clinics and the Phillips community diabetes support group participants (n = 48) had improved diabetes health outcomes relative to the control group (n = 87). The intervention group employed motivational interviewing and PAM in coaching diabetes self-care and behavioral modification. The control group received only basic self-management education. *T* test and Cohen's *d* effect size measurements were used to quantify the size of the health outcome variables' difference between the study intervention and comparison groups. The positive effects of marketplace clinics and community-based complementation were shown through improved blood sugar control (A1C), weight loss (BMI), and healthful lifestyle changes. Social change progress could be realized by incorporating PAM with diabetes prevention programs for 33 Urban Indian Health Organizations that are located in large cities throughout the United States.

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Dedication

This study is dedicated to the growing family of diabetic persons and their support groups. Diabetes runs in many families. Type II diabetes claimed my maternal grandmother and my mother. It is attacking my younger brother Jim; who with the help of his wife Julieah, is courageously combating end-stage-renal disease. We go online almost every evening and help each other. He from his home dialysis rig and me from my computer desk.

Acknowledgments

This dissertation would not have been completed without the support and encouragement of my lovely wife, family, and friends, as well as members of the Walden community. I am grateful to my committee chairman and mentor, Dr. Robert Hoye, whose educational guidance, accessibility, and high quality standards kept me on track. A special thanks to my writing editor, Ms. Mary McClurkin for her graceful skill and corrections. Added acknowledgment goes to Dr. Raymond Thron and Dr. Vibha Kumar for serving on my dissertation committee and for providing their valuable feedback.

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Chapter 1: Introduction to the Study

Background

Many inner-city populations experience disproportionately high disease rates (U.S. Mortality Rates by Race/Ethnicity, Health Disparities, 2006). Among those adversely affected are American Indians, who suffer from diabetes-related illness at a rate 2.5 times greater than the general public (Schiller, Lucas, Ward, & Peregoy, 2012). For the majority of the American Indian population, particularly those residing in urban areas, health care access is limited, and there is a pattern of exclusion and health disparity (Jernigan, Duran, Ahn, & Winkleby, 2010). In the Minneapolis, Minnesota area, American Indians, referred to in this study as *urban Indians* (Forquera, 2001), often struggle for health care access and suffer from higher diabetes incidence than the European American population (Castor et al., 2006).

The Minneapolis metropolitan area has many highly regarded health services and several outstanding health care managers and social change proponents. Stressing the need for universal health care, Halvorson (2009) proclaimed: "We need the courage to actually reform care" and bring health market forces together for the benefit of everybody (p. 12). Historically, for many upper Mississippian Native people, such transformative leadership was engendered by legendary chief Hole-In-The-Day (Treuer, 2011). Welty et al. (1995) recommended diabetes preventive measures for reservation-based American Indians. Anderson et al. (2007) described the Minneapolis Native American Community Clinic (NACC) diabetes care program as an effective integrative health care model. Anderson et al. (1995) found that participation in a *patient empowerment* program

improved self-efficacy and reduced A1C blood sugar levels. Researchers have also found that *patient activation*, a term that means having the knowledge, skills, and confidence to manage an individual's own health (Mosen et al., 2006, p. 21), is related to desirable health outcomes, a result that was also borne out by Remmers et al. (2009). In a study conducted for the Fairview University of Minnesota Health Services, Greene and Hibbard (2012) found that patient activation was an effective intervention. Greene and Hibbard (2012) acknowledged their study sample was limited to privately insured patients; yet, recommended that future studies include persons insured under the Affordable Care Act, including Minneapolis medically underserved minority persons.

In this study, I focused on learning the extent to which *marketplace clinics* (such as those located in the pharmacy areas of CVS, Walmart, Target, Supervalu, or other shopping centers) can expand health service access and promote *complementary care* for community-based diabetes support groups, such as A Partnership of Diabetes (APOD). See Table 1.

Table 1

Minneapolis Phillips Community Collaborative

Project	**Location and description**	**Collaborative role**	**Use**
Retail walk-in marketplace clinic.	Various neighborhood walk-in clinics located within walking distance or a 10-minute bus ride.	CVS, Walmart, Target, Supervalu or other shopping marketplaces	Not known
A Partnership of Diabetics (APOD).	In the Minneapolis Phillips Community Center and 2 blocks from NACC and UIHO.	Coordinate community group and diabetes support.	100+
Native American Community Clinic (NACC) and Urban Indian Health Organization (UIHO).	Serving the same community, APOD, NACC, and the Indian Health Board of Minneapolis (UIHO) operate with only 3 physicians; yet serve over 20,000 patients, including 3,000 persons with diabetes.	Health services coordination with area health care providers, government, and community groups, such as APOD.	Not known

The APOD community-based diabetes support group is located in the Minneapolis, Phillips Community Center. See Figure 1

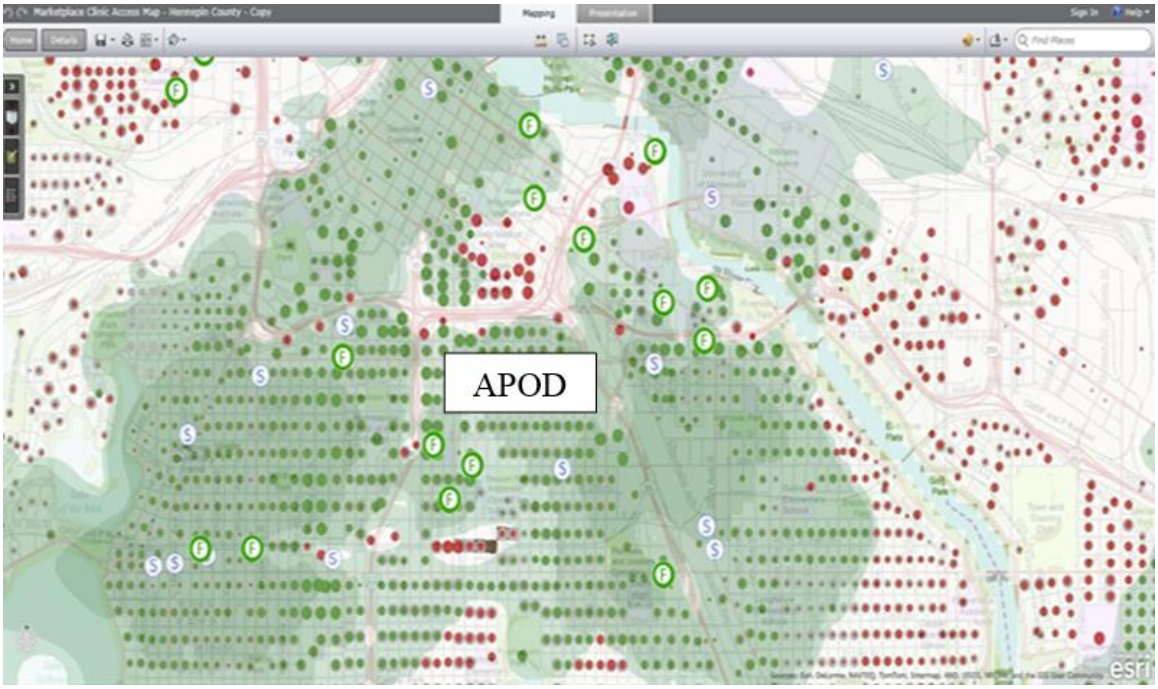

Figure 1. Minneapolis inner-city Phillips neighborhood map

The green region shows the south Minneapolis Phillips community, a medically underserved area. The green dots represent uninsured, unemployed, ethnic, and cultural minority populations residing in the mapped census tracts, while the red dots represent more affluent census tracts. The heart of the Phillips neighborhood, surrounding APOD, is comprised of one of the countries' largest urban Indian populations. Away from their home reservations and Indian Health Service (IHS) contracted clinics, most urban Indians must rely on other health services or do without health care (Zuckerman, Haley, Roubideaux, & Lillie-Blanton, 2004). The marketplace clinics, A Partnership of Diabetics (APOD), Native American Community Clinic (NACC), and the Urban Indian

Health Organization (UIHO) comprise the health services setting for this research study. The marketplace clinics, APOD, NACC, and UIHO site locations are shown in Figure 2.

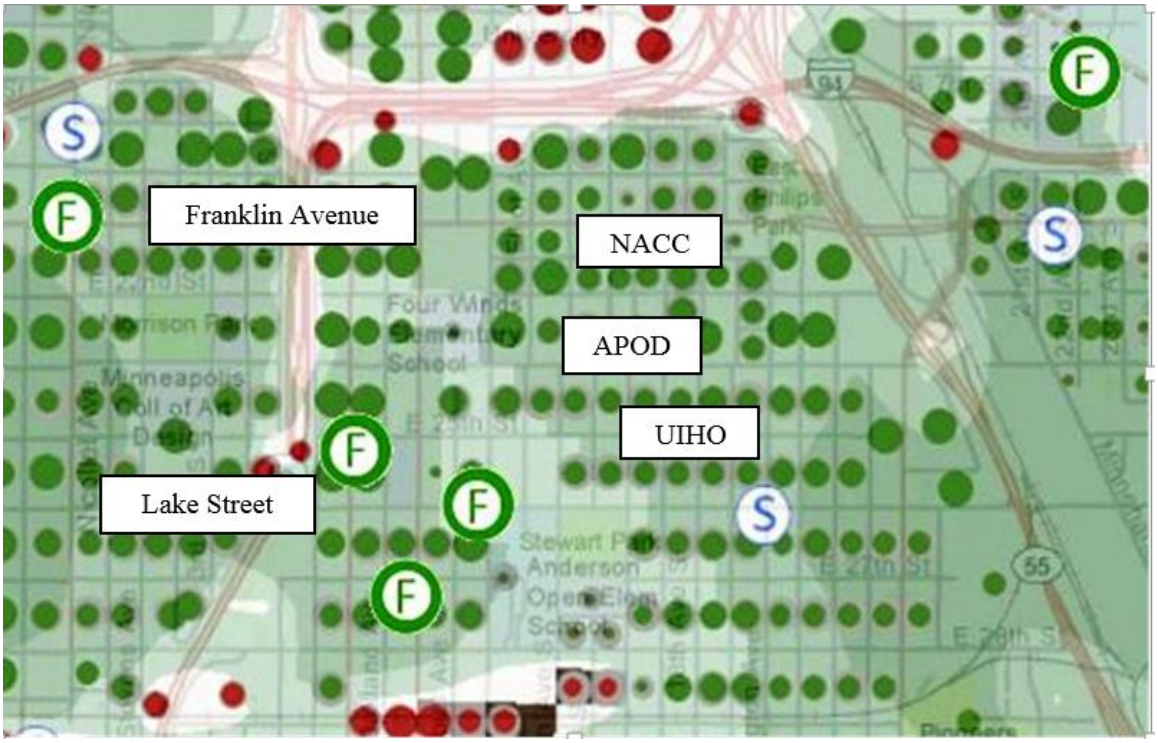

Figure 2. Minneapolis marketplace clinic site locations

The APOD, NACC, and UIHO service areas are in the heart of the Minneapolis Phillips medical underserved area and near the several marketplace clinics. Areas marked S are in-store shopping center sites, and the F shows food market locations. The Phillips neighborhood has eight marketplace clinics. The Franklin Avenue CVS MinuteClinic and the Lake Street Target Store MinuteClinic are among the original retail health clinics, both established in 2000 with Walmart entering the area in 2004 (Thygeson, Van Vorst, Maciosek, & Solberg, 2008). Locations marked S are in-store pharmacy sites (left to right - CVS, Target, and Walmart), and the F shows food market locations (left to right – Supervalu, Cub, Aldi's, Rainbow, and Lund's). Marketplace clinics have been shown to

be both cost and quality effective in Minneapolis and throughout the country (Mehrotra et al., 2009), although some quality of care concerns have been noted (Rohrer, Wilshusen, Adamson, & Merry 2008).

The Minneapolis Phillips neighborhood is the home of the first of 34 UIHOs (Bergman, Grossman, Erdrich, Todd, & Forquera, 1999). The Minneapolis UIHO was federally qualified in 1976 under the U.S. Public Health Service, Urban Health Initiatives program (National Health Planning and Resources Development Act, 1975), formally implemented in 1977 with U.S. Public Health Service, Indian Health Care Improvement Act (1976) funding, and permanently authorized under the Affordable Care Act (Patient Protection and Affordable Care Act, 2013). The community-based APOD was established in 2010 with an initial ("Novo Nordisk Partners," 2009) and has been sustained by Allina Health Systems sponsorship (Community at the Core: Backyard Initiative Assessment Report, 2014). APOD is an important part of the Phillips and urban Indian community complementary network (Albee, 2012).

As part of a community health promotion effort to help reduce the disproportionately high Minneapolis urban Indian diabetes illness rate and promote community health access, the Takoda Institute of American Indian OIC (2014) prepared and distributed 100 diabetes referral and awareness flyers throughout the marketplace (Appendix A). In this study, I examined the extent to which Minneapolis marketplace clinics such as CVS, Walmart, Target, and Supervalu stores expanded health care access and effectively complemented community-based and urban Indian programs.

Statement of the Problem

Rates of diabetes, or more specifically Type 2 adult onset diabetes, are much higher among American Indians than the overall U.S. population and are particularly high in urban Indians (Schiller et al., 2012). The Minneapolis, Minnesota demographic health data, health status, and health disparities information was compiled by Hennepin County Community Health Department (2002). It described an area encompassing a 2000 population of 1.1 million with a small (2 to 3 %) population growth expected by 2010 (Hennepin County Community Health Department, 2002, p. 127). The U.S. Census Bureau (2010) estimated that the population of Minneapolis in 2010 was 382,578. In 2000, the population of Minneapolis was 382,618 but fell by 0.1% between 2000 and 2010 (U.S. Census Bureau, 2010).

My review of the most recently available Hennepin County and Minneapolis racial and ethnic health reports have indicated a diabetes health disparity exists among the urban Indian population. According to Hennepin County Community Health Department (2002), Minneapolis has a relatively low (5%) overall average rate of diabetes. However, considering the high rate of diabetes (Hennepin County, 2002, p. 19) and obesity (Hennepin County, 2002, p. 69) among urban Indian racial minorities, there is a diabetes health disparity. Based upon the Hennepin County and Minneapolis Shape (2002) report and the U.S. Census (2010), the city of Minneapolis is considered above average socioeconomically, has health care resources, and has better than average health outcomes. Hennepin County urban Indians residing in certain inner-city census tracts suffer diabetes at a disproportionately high rate – 3 times greater than Minneapolis all

races (5%) average and two-thirds again as much as the next most health disparate minority population ("Hennepin County Community Health Department," 2002). See Table 2.

Table 2

Minneapolis Diabetes Disparities by Population Racial Minorities

Population Group	**% of Total**	**Diabetes Rate**	**Obesity Rate**
Urban Indian	3.0%	15.1%	28.2%
African American	15.3%	9.2%	25.7%
Hispanic	7.8%	4.4%	19.4%
Asian American	6.9%	3.8%	10.9%
White Majority	67.0%	4.5%	15.3%
All Races	100.0%	5.0%	16.6%

My review of current national and regional vital statistics have indicated a diabetes health disparity exists among the Minneapolis urban Indian population. According to Schiller et al. (2012), the Minneapolis diabetes prevalence of 14.3% of the population of the group is more than 2.5 times higher than the general population (5.3%) and higher than the 7.2% diabetes rate for the Northern Minnesota reservation residents (Bemidji Area Diabetes Care Summary Report, 2004). According to the Urban Indian Health Institute (UIHI), such disparate rates are predicted to have dire consequences for the Minneapolis urban Indian population of 20,000 people, including the nearly 3,000 individuals and families suffering from diabetes-related illnesses (UIHI, 2012).

The implications drawn from these Minneapolis urban Indian population demographics are twofold. First, the lack of affordable health care access portends significant health disparity (Johnson, Blewett, Call, & Davern, 2010). The second concern is the misdirected Indian Health Service funding allocation (Ned, 2013), of which 99% of the funds are granted to reservation residents rather than equitably sharing with the two-thirds majority of the United States' 4.1 million American Indians living in urban areas (Urban Indian Health Commission, 2007). The Minneapolis Native American Community Clinic receives no Indian Health Service subsidy ("Native American Community Clinic," 2014). Without adequate clinical resources, many Minneapolis urban Indians have difficulty getting health services at dwindling numbers of county, charitable, or other health clinics.

Nature of the Study

As a result of several decades of exclusivist IHS and federal assimilation policies, most American Indians reside in urban areas (Forquera, 2001). According to the UIHI (2012), this relocation has resulted in urban Indian health services access shortages, as most health care resources are still on Indian reservations. Although the U.S. Indian Health Care Improvement (1976) Act targets funding for urban Indian health care, these programs received less than 4% of the IHS budget (UIHI, 2014). Inequity of this magnitude has resulted in inadequate urban Indian health benefits (Brega et al., 2011). Cowie et al. (2009) predicted a diabetes prevalence increase over the next 20 years, as associated costs are expected to increase threefold. With this financial projection, there is concern that urban Indian health services will be diminished. Already underfunded,

Philis-Tsimikas et al. (2012) warned that UIHO culturally appropriate diabetes care and behavioral counseling services may be further reduced.

As a result of the Affordable Care Act, there are now some 30 to 40 million newly insured citizens who are entitled to health insurance for primary and chronic health problems. As provider/patient relationships develop, there have been increased demands to refer and provide follow-up care. In many health care systems, primary care physicians are the care managers and gatekeepers. This presents these practitioners with a backlog of unmet patient and community health needs. Halvorson (2013) described how some large health care organizations may overlook chronic disease control for racial and minority communities (p. 2). Halvorson recognized the high rate of diabetes among all ethnic groups and emphasized the much higher diabetes health disparity among the American Indian populations (p. 3).

Seeking some practical problem definition, I broke the urban Indian lack of health care access and health disparity issues down into their base components. Halvorson (2013) noted that racial and ethnic minority patients, including American Indians, are less likely to have even one primary caregiver, much less a team of accountable caregivers. The U.S. Department of Health and Human Services (2013) concluded that disparities and care gaps result from inadequate access to primary care, team care, and proactive or empowered community care. According to Halvorson, "the new Accountable Care Organization approach" is intended to help solve the longstanding problem of care delivery infrastructure lacking proactive delivery of care for the future health care needs of minority patients and communities (p. 62).

In pursuit of a reasonably robust problem resolution, I considered building upon similar urban health improvement programs who had experience improving health care access and reducing health disparity. From a community-based perspective, Jernigan et al. (2010) described their research regarding a predominantly Hispanic diabetes program at Santa Clara, California. The urban project used the Stanford Chronic Disease Self-Management Program (Lorig, Ritter, Villa, & Armas, 2009), which had shown health improvement promise for racial and cultural minority populations. I proposed a similar diabetes prevention and health promotion program for the Minneapolis urban Indian community. At issue was whether APOD program (Albee, 2010), implemented by Minneapolis marketplace clinics and community-based support, could effectively complement community-based health services, increase patient activation, and improve diabetes health outcomes.

Purpose of the Study

The purpose of the study was to determine whether the collaborating marketplace clinics and APOD participants get better at managing their diabetes relative to the control group. Participants were grouped according to their marketplace complementation (marketplace clinics and community-based diabetes support or other federal/state subsidized clinics). This study involved two groups of diabetic persons from the south Minneapolis medically underserved area – including the urban Indian community. Both groups participated in educational and group support forums aimed at strengthening self-management activities and improving outcomes. The marketplace complemented intervention group (APOD) participated in the Patient Activation Measurement (PAM)

and motivational interviewing programs, which were designed to increase participant confidence in taking care of their diabetes condition (Hibbard & Greene, 2013). The federally funded control group (UIHO) provided typical clinical care and diabetes education services.

The intended research focus was diabetes care capacity expansion, diabetes self-management education, and patient activation. The Urban Diabetes Care and Outcomes Audit Report (2012) stated that increased primary care access for the medically underserved Minneapolis urban Indian community was a critical need (UIHI, 2014). The American Diabetes Association (ADA), (2014) described diabetes self-management education as an essential quality of care prerequisite (pp. 64-65). People with diabetes who have participated in a self-management program, compared with usual-care control subjects, demonstrated positive health outcomes (Anderson et al., 2007; Lorig et al., 2009; Hibbard & Greene, 2007). My case-control research was designed to measure the degree of collaborating marketplace clinics and APOD diabetes prevention, activation, and social change effectiveness.

I also examined what influenced marketplace clinic's integrative health care into the Minneapolis urban Indian community. With reference to the Hibbard, Stockard, Mahoney, and Tusler (2004) Patient Activation Measure and Motivational Interviewing programs, I considered whether complementary marketplace clinics and community-based diabetes support groups are capable of activating knowledge, skills, and confidence to achieve better health outcomes.

Research Questions

The study consisted of a quantitative approach. Using the PAM standard survey instrument, I investigated the extent to which Minneapolis Marketplace clinics such as CVS, Walmart, Target, or Supervalu stores have broadened their business plans to provide health services for urban Indians. The study was conducted within the analytical framework of the PAM 13 measurement instrument to assess consumers' knowledge, skills, and confidence for self-management. I evaluated the effects of diabetes patient empowerment, activation, and community-based support with respect to medical outcomes (blood sugar (A1C), blood pressure (BP), or body mass index (BMI). Informed consent was explained for the participants that the study was intended to learn more about the behaviors and health of people with diabetes and find what might help diabetic persons become healthier.

In this study, I questioned the degree with which inner-city Minneapolis marketplace clinics complementing community-based APOD effectively met the ADA quality standard of care for the Phillips medically underserved and the urban Indian subpopulation. According to Deming (1986), quality is of paramount priority. The quality standard of diabetes care is set by the ADA Standard of Medical Care in Diabetes (2014), which calls for complementary community-based diabetes self-management and support (pp. 64-65). With reference to the ADA (2011) quality health improvement standard (p. 47), my main research question is whether there is a significant diabetes medical outcome (diabetics with an A1C % less than 7) mean value difference among case-control groups.

Main Research Question

Consistent with statistical procedure conducted for research studies, Green and Salkind (2011) recommended connecting hypothesis with corresponding research questions (p. 183). Thus, the main research hypothesis is stated as follows:

- $H_0$1*:* The marketplace clinics and community-based APOD diabetes health improvement measure (A1C lt. 7%) is not significantly different than the usual-care control group.
- $H_1$1*:* The marketplace clinics and community-based APOD diabetes health improvement measure (A1C lt. 7%) was significantly different than the usual-care control group.

The research design yielded additional (from pretest to posttest) subquestions and hypotheses are shown, as follows.

Subquestions and Hypothesis

Secondary research questions were derived from the Hibbard and Greene (2013) self-reported PAM survey scale regarding study participants' diabetes monitoring and self-management activities. Bandura (2012) found that a collective self-efficacy can encourage a community's self-sufficiency. Therefore, in this study, I applied these motivational propositions and tested the related research question and hypothesis accordingly: Are there significant diabetes medical outcome (A1C, BMI, and BP) mean value differences among case-control groups?

Subquestion 2: To what degree did the diabetes clinical measures (A1C, Blood Pressure (BP), and BMI) significantly improve; more for the APOD diabetes study group than for the usual care control group?

*H*2: The diabetes medical outcomes (A1C, BMI, and BP) survey improved significantly more for the group that takes part in the APOD community-based program than for the control group.

Greene and Hibbard (2012) found that patient activation was an effective intervention. The related research question/hypothesis inquires the following: Whether having the knowledge, skills, and confidence to manage one's health, is strongly related to desirable health outcomes?

Subquestion 3: To what degree did the PAM scores increase significantly more for the APOD diabetes support group?

*H*3: The PAM proportion of South Minneapolis medically underserved persons and urban Indian persons with diabetes who effectively monitor their diet, exercise, and lifestyle activities, as well as manage their medications, blood testing, and medical care behaviors increased significantly more for the APOD intervention group than for the control group.

In Chapter 3, the research design, the Hibbard and Greene (2013) PAM questionnaire, and the methods of data analysis that addressed each hypothesis are discussed in detail.

Following the data collection, quantitative research measures were used to analyze the extent to which marketplace clinics integrate primary and behavioral care and

APOD participants' reciprocal diabetes treatment effect. For my retrospective analysis, I applied the IBM Statistical Package for Social Sciences (SPSS) version 21. The research analysis was conducted to determine whether there were post intervention patient activation and health outcome differences. This research project aim was to find ways the Minneapolis marketplace clinics and community-based diabetes support groups can help medically underserved persons and urban Indian participants achieve positive health changes.

Theoretical Base

Egan et al. (2009) reported that American Indian health beliefs and behaviors operate as a locus of control function to reveal whether self-reliance, powerlessness, or chance circumstances motivate health care seeking habits. As secondary research to the Welty et al. (1995) Strong Heart Study, Eagan et al. (2009) concluded that clinicians should identify psychological issues and counsel American Indian patients in culturally sensitive ways with the goal of improved preventive care delivery and increased diabetes health education efficacy. Anderson et al. (2007) described NACC as an innovative diabetes and behavioral care best practice, capable of providing culturally appropriate health services for urban Indians.

People's beliefs in their self-worth play a role in how well they organize, adapt, and manage stressful health and welfare circumstances (Bandura 1995, p. 26). Self-efficacy theorists acknowledge the health protective importance of gaining control over threatening situations. In this regard, psychologically empowering self-management education to help patients cope with stressors was described by Funnell and Anderson

(2004) as essential for quality diabetes care. Similarly, Anderson and Olayiwola (2012) described diabetes empowerment as a means to help patients set goals and make decisions that are both effective and fit their values and lifestyles, while taking into account multiple physiological and personal psychosocial factors.

Innovative intervention strategies that activate patients' confidence in taking responsibility for daily diabetes care are effective in helping patients care for themselves (Hibbard & Greene, 2013). The marketplace and community-based diabetes support study can be conducted within the analytical framework of PAM and motivational interviewing to assess a person's confidence, skill, and knowledge for self-managing diabetes health. The study's main theoretical foundation was that APOD's complementary network of community-based diabetes care and patient activation influence blood sugar (A1C), BP, and BMI clinical outcomes. Reflecting the Pronk, Kottke, and Isham (2013) triple medical, lifestyle, and social policy objectives, I advanced a clinical, community, and support group assessment of marketplace clinic collaborative for complementing medically underserved and urban Indian diabetes care.

Definition of Terms

For purposes of this research the following definitions were used.

A Partnership of Diabetics (APOD): A community organization located in the South Minneapolis Phillips neighborhood where diabetic persons meet to share strategies and activate a complementary network for diabetes self-management, wellness, and social support (Albee, 2012).

*A1C blood sugar***:** Glycosylated hemoglobin (HbA1C) is a measure of the percent of blood glucose attached to a hemoglobin molecule and an indicator of the past 3-month lifestyle and self-management control (Krishnamurti & Steffes, 2001).

*Complementary care***:** A nonmainstream approach together with conventional medicine to provide a more complete health care service (National Center for Complementary and Integrative Medicine, 2011).

*Complementary and Integrative health care***:** Many health care providers and health care systems are integrating nonmainstream complementary and integrative medicine into treatment and health promotion practices. The marketing is based on emerging evidence that the perceived benefits are real or meaningful (National Institute of Health, National Center for Complementary and Integrative Medicine, U.S. Department of Health and Human Services, 2014).

Marketplace clinic: A retail walk-in clinic, which is generally staffed by a nurse practitioner, supervised by a physician, and able to provide basic primary care as well as diabetes monitoring services. Also known as a retail clinic or convenience clinic because no appointment is required, evening hours are available, and it is staffed daily. Sites are located in pharmacy sections of major shopping centers or food stores.

Medically underserved: Persons without primary care providers whose communities are marked by high infant mortality and poverty ("National Health Planning and Resources Development Act," 1975).

Patient activation: Having the knowledge, skills, and confidence to self-manage one's own health (Hibbard et al., 2004). The PAM was copyrighted by Insignia Health in 2009.

Patient empowerment: The complementary effect gained when provider/patient partnerships elicit psychosocial self-efficacy, change satisfaction/readiness, and goal attainment (Anderson et al., 2003).

Type 2 adult onset diabetes: Type 2 or adult onset diabetes accounts for over 90% of diabetes in the U.S. population (ADA, 2008). Type 2 diabetes occurs when the body does not produce enough insulin or the cells ignore the insulin (ADA, 2008).

Urban Indians: Persons living in predominantly urban Indian neighborhoods who are American Indian descendants or who self-identify as such (Forquera, 2001).

Urban Indian health organization (UIHO): An inner-city community health center operating for urban Indians that provides health services described in Title V of the Indian Health Care Improvement Act (1976). For this study, the UIHO is the Indian Health Board of Minneapolis.

Assumptions, Limitations, and Scope

It was assumed that most urban Indians lack health services and are at risk of increased diabetes incidence without more inclusive access to medical care. It may also be assumed that accessing diabetes care during this period of health reform in the United States presents a predicament for many urban Indians. In addition to many being uninsured and underserved, an increasing numbers of newly insured patients are competing for services. Thus, urban Indians with diabetes may encounter even greater

access delays and refusal as they navigate difficult intercultural relationships, care inadequacies, and other ethnic and cultural barriers.

I presumed that complementary and integrative care strategies would have successful application in South Minneapolis. Project costs limit the number of cases that can be studied and may constrain participant notification and recruitment. Although evaluation did not directly address the diabetes health disparity issue, the knowledge, skills, and confidence responses returned from the patient activation survey are expected to provide useful quality of care insight from the urban Indian patients' perspectives.

Significance of the Study

Although many scholars (Egan et al., 2009; Welty et al., 1995) have described the broader American Indian population health disparity, there are few research projects, such as that of Anderson et al. (2007), which address urban Indian health care and advance research applications which are specific to health care improvement. Few evidence-based research articles, such as Rosenbaum, Finnegan, and Shin (2009), discussed matters of critical concern for the urban Indian community. So it was not known whether limited access to affordable health care deprives the underserved urban Indian population of fully integrated health services during this period of health reform and economic recession (Rosenbaum et al., 2009). The significance of this research project is that it accepts the urban Indian health disparity challenge and commits action research toward urban Indian health improvement.

I hypothesized that a collective self-efficacy spirit can encourage the Minneapolis urban Indian community's self-determination and elicit more inclusive marketplace clinic

and community-based diabetes support (Bandura, 2012). In the study analytics, I measured diabetes empowerment (Anderson et al., 2003), patient activation (Hibbard et al., 2004), and partnership support (Albee, 2012) influences. Greene and Hibbard (2012) yielded positive results for general population adults. Lorig, Sobel, Ritter, Laurent, and Hobbs (2001) described the prospective health-related benefits expected from activating diabetes patient self-management. These beneficial outcomes included regular exercise, symptom management, physician communication, and social function with fewer hospitalizations and shorter stays (Lorig et al., 2001).

This study was designed to evaluate the extent to which marketplace clinics extended their business model to be more culturally aware and inclusive of urban Indian persons with diabetes. The working hypothesis was that complementary consumer empowerment, patient activation, and community-based diabetes self-management education can effectively improve diabetes health outcomes for all - including the urban Indian study population. The research findings may provide guidance for integrating diabetes self-management services into Minneapolis and the United States' 33 urban Indian clinics.

Summary of the Study

Primary and behavioral health services integration is a goal of the 2010 Affordable Care Act. Nationally, transformative policy initiatives are progressing well for the majority (Davis et al., 2013), and there are many community-based diabetes outcome improvement programs (Strickland, et al., 2010). The Minnesota Health Care Home is a leading health care reform model, which is thought to complement community health

centers in achieving continuous, comprehensive, and coordinated care (Rittenhouse, Shortell, & Fisher, 2009). These innovative models (Christensen, 2009) combine primary and behavioral care with best practice innovations, such as the use of electronic information systems, community collaboration, and continuous quality improvement.

In order to develop an effective real world study approach, I considered the experiences of leading health care authorities. Chin (2010) studied 900 community health centers and concluded that many of the more successful clinics had formed public/private collaborates and were achieving substantial quality of care improvement. The collaborative models were considered socially positive and increasingly accepted; yet, the high health care costs were seen to have eroded the quantity and quality of services (Chin, Goddu, Ferguson, & Peek, 2014). Upon reflection, it appeared that policy reforms alone cannot sustain health centers that serve underinsured and underserved populations.

In Chapter 1, I introduced the study and explained the background, assumptions, limitations, terms, current programs, and the unique need for carrying out marketplace clinics and complementary diabetes support group research. Chapter 2 provides an overview of the current literature, research, and studies related to collaborating marketplace clinics and diabetes support groups, as follows:

1. IHS history and the increasing diabetes prevalence among urban Indians.
2. Socioeconomic barriers and cultural traditions that hinder urban Indians from participating in marketplace clinic and diabetes support groups.
3. Methods to promote social and behavioral changes to help the target population embrace the actions steps necessary for prevention and self-managed care.

Chapter 2: Literature Review

Introduction

This chapter includes a review of the current literature regarding American Indian health services policy and management. Sources include electronic databases such as ProQuest Central, ProQuest Dissertations, Theses Database, and Google Scholar. Key words used to search the literature included *urban Indian, diabetes disparity, universal access, inclusion, retail clinic, community engagement, complementary care, patient activation, community-based support group,* and *diabetes self-management education.* The chapter also includes American Indian and urban Indian literature sources related to health services applications for more inclusive access, community care engagement, and diabetes support group coordination.

Additional information includes descriptions of urban Indian health services history, the disproportionately high diabetes prevalence, and health services policy and management challenges and opportunities regarding diabetes prevention and self-management education programs. The chapter concludes with the potential methodology determined to be the appropriate approach for this inquiry. In this quantitative research, I evaluated the degree to which Minneapolis marketplace clinics committed their business models in expanding access and complementing community-based health services, such as APOD.

The literature review includes research publications during the past 5 years, which revealed an abundance of health services studies describing the condition of the

medically underserved American Indian population. Publications from 2013 alone numbered in the hundreds of articles confirming that the urban Indian subpopulation lacks primary health care and are at risk of increased diabetes incidence without expanded health access. Few health services publications have addressed the connection that American Indian health and, in particular, urban Indians have with health reform policies, universal access, and quality of care. Articles presented here are those which have relevance to the Minneapolis community and urban Indian health services movement.

Review of Diabetes Prevalence and Related Research

The Welty et al. (1995) Strong Heart Study is the largest and most widely referenced epidemiological study of American Indians. Researchers collected medical and psychosocial data from the Northern Plains, Southwest Pima reservations, and Oklahoma City and found significantly higher cardiovascular disease rates compared to European Americans (Welty et al., 1995). In subsequent research, Howard et al. (1999) analyzed the Strong Heart Study data and found a connection between cardiovascular disease and diabetes, particularly among the Northern Plains Indians. In a continuation of the longitudinal Strong Heart Study, Egan et al. (2009) studied American Indian health beliefs and considered diabetes self-controlling care to be a function of self-reliance, powerlessness, or chance. Egan et al. (2009) concluded that clinicians should identify psychological concerns and counsel American Indian patients in culturally sensitive ways, with the goal of improved diabetes health care delivery and self-management efficacy.

Up to this point, the health service research literature pertained primarily to reservation based American Indians. Discussing the urban Indian experience, Anderson et al. (2007) described the Minneapolis NACC health services, behavioral care, and self-management education as a diabetes care best-practice. Without continuing grant support (Davis et al., 2012), however, the implemented diabetes prevention and health improvements could not be sustained (Anderson & Olayiwola, 2012). American Indian cultural and chronic predisposition to diabetes is often studied. Less often researched, however, are quality issues resulting from the lack of diabetes health care resources (Mohammed, 2004). For the Minneapolis urban Indian community, there is a growing concern for the lack of primary care access, as health reform promises have been made, but have yet to materialize.

My literature search included national health policy concerns which I considered may adversely affect universal health care access and urban Indian population health. In his testimony before the House Appropriations Subcommittee on the Interior, Barnett (2013) attested to a "harmful confusion, frustration, and despair" condition because the Affordable Care Act overlooked health care insurance coverage for many urban Indian persons (p. 113). According to the Urban Indian Health Commission (2007), other cultural minority populations have increased access and available primary care alternatives; however, Indian Health Services provided primary care remains inadequate for two-thirds of its medical service area. Consequently, the urban Indian population has limited health services at dwindling county, state, federal, or charity health clinics, while public/private collaboration is expanding marketplace clinic capacity elsewhere.

Senate Bill 1575 (2013) clarifying the Affordable Care Act term Indian was authored by Begich and cosponsored by Franken. For purposes of clarification, the term was amended to make it consistent with the existing IHS and Medicaid health care eligibility criteria. U.S. Senate bill 1575 proposed that an Indian be defined as an individual who is a member of a federally recognized tribe or an urban center resident of Indian descent.

Tribal membership recognition is a step forward for the Minneapolis urban Indian community. Many, if not most Minneapolis urban Indians, are Chippewa or Ojibwa descendants. The White Earth Tribe, which has the largest Minnesota American Indian membership, approved a new constitution that changed tribal government and replaced the blood quantum requirement with a family lineage membership criteria ("White Earth Band Votes," 2013). In addition to the more inclusive health services policy, perhaps the expanded enrollment opportunity helps bring positive social change to the marketplace clinics and urban Indian community partnership movement.

The main theoretical framework for this study encompassed literature addressing community-based participatory research (Brownson, Hoerger, Fisher, & Kilpatrick, 2009), social cognitive-learning (Bandura, 2012), complementary and integrative applications (Chin et al., 2014), and urban Indian community health clinic best practices (Anderson et al., 2007). The research framing the theoretical application reflected the thesis that urban Indians lack primary care access and suffer diabetes rates at twice that of the general population and half again more than their reservation relatives (Forquera, 2001).

My literature search included national health policy initiatives which I considered may promote universal health care access and urban Indian population health. The Centers for Disease Control and Prevention (2009) sponsored public-private partnership of communities, health care organizations, and government agencies with the goal of preventing or delaying the onset of diabetes in high-risk populations (Flegal et al., 2010). Additionally, the National Diabetes Prevention Program supports the chronic care model, which is culturally tailored for community-based care serving underinsured patients (Jenkins et al., 2010). According to Coleman et al. (2009), community care models have the potential to help extend and enhance the ad hoc, time-limited projects that have characterized many clinic initiatives up to this point. Anderson and Olayiwala (2012) demonstrated that community health centers and patient-centered medical home partnerships can provide sustainable health care for the poor and medically underserved.

This studies major theoretical proposition is that self-efficacy and diabetes complementary care within a cross-cultural, political, and economic context improves the quality and continuity of diabetes care. For American Indian health services, several levels of change have occurred over the past 4 decades since landmark health, education, and welfare legislation was enacted (Rhoades, Chris-Carey, Jacobs, & Brenneman, 2008). Health care access to quality health services has been achieved for millions of people in the United States. The combination of the National Health Planning and Resources Development Act (1975), the U.S. Indian Health Care Improvement Act (1976), and the land grant college emergence in many large cities has advanced integrated health services and universal access policies which have, in turn, benefited

most people in the United States and many American Indian populations. Yet, there remains a diabetes health disparity among some cultural and ethnic minorities, such as urban Indians. For the Minneapolis inner-city residents and the urban Indian population, a collective self-efficacy, such as espoused by Bandura (2012) and patient activation (Hibbard & Greene., 2013), may be envisioned as a way to promote health care progress for the entire community.

Whether socially and economically motivated or politically compelled by the need to relocate to the city, many urban Indians experience health services access shortages (UIHI, 2012). Whereas, it may be widely assumed that most American Indians reside in tribal areas where Indian Health Services provide health care resources; yet, the reality is that over two-thirds of American Indians live, work, and study in urban areas (Forquera, 2001). In theory, equitable health care reform implementation would follow the democratic process. Majority populations would be served initially and racial and cultural minority inclusion could follow the constituted representation level. At issue, however, is the need for a more clear reform agenda and an awareness (Halvorson, 2009, p.1). According to Halvorson (2013), disparities and care gaps result from inadequate access to primary care, team care, and proactive or empowered community care. Halvorson (2013) described an accountable care organization approach as a potential health care delivery innovation capable of meeting the future health care needs of minority patients and communities (P. 62).

The Jernigan et al. (2010) publication provided a useful reference for implementing the Stanford chronic disease self-management program (Lorig et al., 2009).

I applied the (Hibbard & Greene, 2013) PAM survey tool for my diabetes prevention program evaluation. The copyright licensed Insignia Health, PAM-13 is shown as Appendix B. My study concluded the marketplace clinics and community-based APOD program could expand quality of care, increase patient activation, and improve health outcomes for all, including the many Minneapolis medically underserved and urban Indian persons with diabetes.

History of urban Indian Health Care

Historically, political and other competing forces may have given health and welfare advantages to majority groups and other, more powerful, minority groups. According to the Healthy People 2020 priority objectives, however, it is time that racial and cultural minorities, including the urban Indian subpopulation have an opportunity to compete in the marketplace ("Healthy People 2020," 2010). In the past, Minnesota political figures have championed the passage of health and welfare legislation. Former Minneapolis mayor, Minnesota senator, and vice president of the United States Hubert Humphrey was at the forefront during the development of Medicare policy. Humphrey (1964) previewed his plan for providing federal medical insurance for older people in his book, *War on Poverty*. Humphrey envisioned an equal opportunity society in which public/private programs were rooted in universal access to such basic human needs as health care, a living wage, education, a job, and a safe neighborhood (p. 171). For the Minneapolis inner-city Phillips neighborhood, there persists unequal access to community, social, and health services.

Originating from 1960s civil rights activism, the American Indian Movement (AIM) has continued to influence urban development, social justice, and community health education. As part of a march to Washington in 1972, the AIM presented grievances and demands in protest of the federal government policies (Wittstock & Salinas, 2006). This civil rights statement said far more in response to the broken promises and discrimination than most of the literature - then or since ("U.S. Commission on Civil Rights, Office of the General Counsel," 2004). President Richard M. Nixon acknowledged many of the proclaimed 20 points and led collaborative congressional efforts to enact the National Health Services Planning and Development Act of 1974 and the U.S. Indian Health Care Improvement Act of 1975 (Shannon & Bashshur, 1982). Working together, these U.S. Public Health Service programs have funded and facilitated many community health centers in many states and urban Indian health clinics in many large metropolitan areas.

While recognizing the importance of public health funding to support healthier American communities, it is important to remember that political patronage and administrative mishaps are exasperating for some unrecognized American Indian tribes and many urban Indian communities. Since the 1976 Indian Health Care Improvement Act, the United State Congress has made many health services promises to aid urban Indians, yet there have been few dollars allocated and little progress (Urban Indian Health Commission, 2007). Director of the Urban Indian Health Institute Mr. Ralph Forquera presenting at the 2010 Public Health Research Institute conference stated (para. 3) that "With less than 1% of Indian Health Services funds awarded to urban Indian clinics,

there is concern that urban Indian populations was not receive the health care promised in federal law and treaties" (Errickson et al., 2011).

Considerable tribal health care progress has been made; yet, as past IHS director, Dr. Everett Rhoades concluded, "It was be generations before Indian people are more easily able to lay aside the results of centuries of exploitation and loss associated with interactions with non-Indians" (Rhoades, 2000, p. 432). In an article describing the challenges of providing affordable and accessible health for all American Indians, Rhoades, Chris-Carey, Jacobs, and Brenneman (2008, p. 1) wrote: "The facts around health disparities have become part of the lexicon of healthcare delivery, while evidence to help move the metrics have been sadly delayed". It has been nearly 40 years since the National Health Planning and Resources Development Act (1975) was enacted. In that time, dedicated health services professionals have accomplished their work and have pointed the way for the next generation to take up the tasks that need to be done.

According to the Healthy People 2020 report, published in 2010, a national priority was placed on the finding of more effective health delivery systems that promote quality health care access and reduce health disparity. Summarizing the past decades progress, Assistant Secretary of Health Koh (2010) concluded that life expectancy, particularly the number of healthy years after age 65 substantially improved, however, the goal of eliminating health disparities remained unmet. Going forward, additional health services policy initiatives will focus on promoting quality of life, healthy behaviors, and creating social and physical environments that promote good health ("Healthy People 2020," 2010). In pursuit of these national goals, individual state's

implement their own conforming health plans. The Minnesota Legislative Report Card on Racial Equity, reported that the integration of clinical care and lifestyle modification programs was showing promise in reducing the diabetes prevalence among American Indians (Kay, 2011, p. 17).

Consistent with Healthy People 2020 (2010) goals, expanded Minnesota health services, including both access to health care and diabetes prevention initiatives, could improve urban Indian diabetes care. Collaborative programs aimed at expanding diabetes care capacity would also be an important step forward in an effort to reduce health disparities and to increase the quality and years of healthy life for racial and minority populations. For urban Indians, quality diabetes health care comes not only from more inclusive access, but also from better communication and community empowerment.

Evidenced-based findings indicate the need for innovative and complementary health services applications (Philis-Tsimikas et al., 2012). Although social, political, and economic changes in health care may be considered "frustratingly disruptive" by proprietary stakeholders (Christensen, 2009, p. 136), this research effort investigated marketplace clinics and APOD potential to help move the metrics in advancing health care access for all American Indians, including urban Indians.

A 2010 press release noted that a marketplace clinic namely CVS MinuteClinic improved access to health care services for a Washington, DC, low-income African-American neighborhood. The Washington D.C. located CVS marketplace clinic had positive national press and was seen to be emerging as a best-practices model with free diabetes A1C monitoring and Facebook social networking support ("MinuteClinic

Improves Access to Health Care," 2010). While public/private collaboration is expanding under the Affordable Care Act, and there are accessible marketplace clinic resources for some minority communities (Pollack & Armstrong, 2009), urban Indians, who comprise over 3 million of the total 4.1 million American Indian population, remain seemingly invisible (Urban Indian Health Commission, 2007).

Reclaiming and Affirming Health for All Indian People

In the aftermath of the 1960s period of civil unrest, people in the Minneapolis Phillips neighborhood began to join together in support of civil rights for all, including urban Indians. People preoccupied with making a living and raising families were hesitant to get involved; but something seemed different this time. Community activist organizations, such as AIM were speaking out (Wittstock & Salinas, 2006) and their social justice message was being acknowledged by the federal government (Borunda & Shore, 1978). Many of the AIM announced 20 points for social change were responded to in legislation, with the authorization and appropriation of the Urban Indian Health Planning Act ("U.S. Indian Health Care Improvement Act," 1976). Working together, these U.S. Public Health Service programs have funded and facilitated many community health centers in many states and urban Indian health clinics in many large metropolitan areas.

Although AIM's early activist tactics may have contributed to some civil unrest, the organization was influential in support of social and health issues. AIM leadership led the movement to reclaim and affirm American Indian health and welfare. The concluding health care section (20th point) of the AIM proclamation presented to the President in

1972 was: “Reclaim and affirm health, housing, employment, economic development, and education for all Indian people”. Placing health care first in their list of demands, AIM was instrumental in advocating support and federal funding of the initial UIHOs. The Minneapolis Indian Health Clinic was the first; followed by Seattle. Through their involvement with Minneapolis urban Indian health care, AIM leadership continues to serve with dedicated UIHO clinic board directorship and community development.

Epidemiologic Strong Heart Study

The Welty et al. (1995) body of work originated in an *American Journal of Epidemiology* paper: “Cardiovascular Disease Risk Factors among American Indians: The Strong Heart Study,” which examined cardiovascular and diabetes disease among American Indians in South Dakota, North Dakota, Arizona, and Oklahoma. The clinical trial surveyed and examined several thousand participants and found American Indians were approximately twice as likely as those majority populations to be poor, unemployed, and uninsured and that such disparities were mirrored in cardiovascular disease, diabetes, and behavioral health disparities.

Over the years, the Strong Heart Studies research data and finding have contributed to the American Indian and the entire United States population diabetes and cardiovascular health. Diabetes prevention progress is attested to by Welty (2014, pp. 157-170) culturally-appropriate diabetes intervention examples emanating from the Welty et al. (1995) Strong Heart Study. A prime example is the Talking Circle innovation which was implemented for the Minneapolis Native American Community Clinic (Anderson et al., 2007).

The Talking Circle program was incorporated in a diabetes wellness model by Anderson and Olayiwola (2012) and was found to be a successful intervention in helping reduce diabetes health disparities for UIHO patients. In another participatory research project, Mendenhall et al. (2012) found Talking Circles a highly valued social support in achieving positive diabetes health outcomes. The Talking Circle program led to an educational program that together with the Lorig et al. (2009) self-management program and the Hibbard et al. (2004) PAM were adopted by APOD and implemented as empowerment and activation steps taken toward diabetes prevention.

Affordable Care Act Promises and Universal Access Challenges

Expanding diabetes health care access during this period of health insurance reform and recession presented a dilemma for many American Indians (Rosenbaum et al., 2009). The (2010) Affordable Care Act mandated fully integrated health service for all Americans by 2014 ("Patient Protection and Affordable Care Act," 2010) including the reauthorization of public health legislation aimed to reduce American Indian and urban Indian diabetes health disparity. Whereas public/private collaboration has expanded community health clinic coverage for the United States majority population, the urban Indian community is left without more actively engaged consumers and limited clinic capacity (Jenkins et al., 2010).

It would seem that opportune programs like the Welty et al. (1995) talking circles project would qualify for funding under the (2009) Affordable Care Act, Catalyst to Better Diabetes Care provisions; yet there is a prerequisite need to demonstrate private and community partners (Section 2717). The health service literature search pointed to

the need for a third partner (Pronk et al., 2013). For the Minneapolis urban Indian community, perhaps such a partner could be an APOD community-based support group (Albee, 2011), so that integrated primary care and community health could join together in complementing medically underserved and urban Indian health services.

Urban Indian Diabetes Prevention and Health Improvement

In my literature search, I found contrasting health services delivery opinions. Grossman et al. (1994) reported comparative health disparities between urban Caucasian, African American, and urban Indian populations and concluded that the relatively poor health status of urban Indians required greater resources from federal, state, and local health authorities. Whereas a Zuckerman, Haley, Roubideaux, and Lillie-Blanton (2004) IHS sponsored article described higher-performing IHS rural or reservation clinic practices as model programs among participating clinic groups, no such progress can be reported for UIHO programs (Moore et al., 2006). Best-practice models for urban Indian clinical services remained undefined as Jernigan (2010) reported severe and persistent health disparities despite substantial integrated health services advocacy.

Anderson et al. (2007) adapted several IHS and ADA recommended quality improvements for the Minneapolis Native American Community Clinic. The Robert Wood Johnson Foundation study enhanced diabetes self-management education and expanded cultural care (Anderson et al., 2007). However, without continuing clinic-community partnership support self-management and diabetes prevention initiatives could not be sustained.

Indian Health Self Determination

The classic Rhoades (2000) book provided an authoritative chronology regarding IHS health services policy and management special cultural and ethical considerations. Writing about the past and future organization of American Indian health, Rhoades (2000) described the positive impact that self-determination policies have had, since the 1960s, in promoting individual American Indian communities health planning and development. Yet Rhoades (2000) posited that American Indian health care was going backward and becoming out of touch with the nationalized transfer of health care management from IHS to tribal governments (p. 443).

In an article addressing American Indian health and the private health sector, Rhoades (2006) wrote, "We need some entity (and it might not be called the IHS) that has a central synthesis function" to equitably consolidate the Indian health services systems that have been operating since 1990: (a) Tribal system of care, (b) Reservation-based, and (c) urban Indian clinics who serve nearly two-thirds of American Indians and receive less than 5% support from tribal or IHS resources (p. 12). A Rhoades (2006) article further explained that integrating three different systems of care is a challenge that IHS must deal with if the federal government expects to "come to grips with the more rapidly increasing urban population". According to Rhoades (2006) another challenge for the IHS and the whole country is the rationing of health care: "Even though some people pretend it's not the case, health care has always been rationed, and it was continue to be rationed" (p. 13). According to Blewett, Johnson, Lee, and Scal (2008) many Minneapolis racial and cultural minority persons do not have a primary care doctor.

Although the scope of this research project cannot meet the health care access inequity, small steps may be transformed into opportunities if marketplace clinics and American Indian communities work together to advance quality health care for all.

Diabetes Health Empowerment

Bandura's social learning, Halvorson's universal health care access, and Albee's diabetes community empowerment theories are sociologically and culturally consistent with communicative action theory (Albee, 2012; Bandura, 2012; Habermas, 1984; Halvorson, 2009). Such empowering and activating theory, as well as the Anderson et al. (2003) and Hibbard et al. (2004) applied research formed the framework for my study. Combined, such implications may complement urban Indian health care inclusion, community empowerment, and diabetes self-management.

Consistent with health care reform, such complementary network is thought to favor public/private partnership adaptation. By contrast, Fay's (1987) critical race or critical social science theories seem inconsistent with the positive social change approach advocated by Albee's (2012) diabetes health empowerment theory. To Fay, adapting to more positively engaged health reform seems to conflict with the politics of social science. Although Fay (1987) provides some examples supporting his critical social change stance, many consider his basic scheme impractical. I construed that the Fay liberation theory has more to do with political protest than educational empowerment. My study applied health empowerment and activation concepts in an investigation of complementary care for medically underserved populations. In this regard, Bandura

(1995) considered that community empowerment and collective efficacy promote better health and influence social reform.

One aim of social inquiry for this topic is to transform contemporary marketplace clinic capitalism into a community health and APOD complementary form of social change (Albee, 2011). In this view, the communicative actions of community care coalitions, partnerships, and collaborates such as marketplace clinics and APOD may be considered a pragmatic health care access expansion (Habermas, 1984). The normative orientation of critical theory is therefore towards the transformation of marketplace capitalism into a real democracy in which complementary consumerism could be exercised (Mackey & Sisodia, 2014). In comparing such real world health reform constructs, there are similarities between Habermas's critical theory (1984) and Halvorson's (2009) "do the right thing" pragmatism.

In Habermas's philosophical works, ideological differences are temporarily set-aside, long enough for engaged participants to reach mutual understanding (Habermas, 1984, p. 367). Halvorson (2009) wrote "Make the right thing easy to do" and acknowledged that his statement seemed more like a slogan than a strategic health policy and management strategy (p. 86). According to Halvorson (2009), actually doing the right thing and providing right care is often thought impractical or politically inexpedient (Halvorson, 2009). However, faced with acute health care shortages and ever-increasing chronic disease, Halvorson (2009) challenged the usual corporate business model by simultaneously stressing broader inclusiveness and better care continuity (p. 97). According to Halvorson (2009), the profound truth is that the best health system is one

that provides good quality health and better care for everyone. It would seem that the Halvorson (2009) universal access concept is also supported by classical theory, in that it is committed to natural law, which Immanuel Kant (1929) thought manifested better human instincts.

With reference to inner city population changes, Bandura (1995) explained, the out-migration of White and African Americans was a result of violence and economic deprivation. For Minneapolis, this socio-economic trend has left a relatively greater concentration of urban Indian, Hispanic, and Somali residents, many of whom experience the ill effects of poverty (Johnson et al., 2010). Such underprivileged demographics may have left this low-income neighborhood with dejected self-efficacy and increased health disparity (p. 28). In this disadvantaged social state, health care visits or medical encounters are a matter of concern.

According to Bandura (1995), clinic encounters are categorized by (a) societal issues where social, economic, and political problems are the cause of day-to-day personal problems; (b) troubling private issues; and (c) real world struggles including family life, sexuality, ageing, substance use, and limited resources for dealing with emotional distress (p. 38). Bandura also stated that the traditional doctor-patient medical encounter is not conducive to communicative expression of real concerns and may present a communications barrier for the medically underserved, working poor, and ethnic minorities.

Diabetes Patient Activation

Remmers et al. (2009) found that patient activation--having the knowledge, skills, and confidence to manage one's health--is strongly related to diabetes health outcomes. Hibbard and Greene (2013) also reported a growing body of evidence that indicated patients who are more activated have better health-related outcomes than patients who are less active and that having the knowledge, skill, and confidence to self-manage one's own health care promotes self-efficacy. The Hibbard and Greene (2013) article also synthesized the findings of several chronic care studies that used the PAM tool in their investigations. From the results of their (2012) study at the Fairview, University of Minnesota Hospital, Greene and Hibbard suggested that future researchers examine the effectiveness of interventions that support patient activation and recommended the inclusion of medically underserved and urban Indian participants. Culturally appropriate communication was also cited as helping patients understand their conditions, set goals, ask questions, and manage their own care.

Hibbard and Greene (2013) implied that provider-empowered patients and certain population groups would emerge and adopt a greater self-care role. However, the change process the authors described may have overlooked an important structural feature. Community-based resources need to be integrated into the health education framework before medical and behavioral information can be effectively communicated. Without these crucial communications, patient activation of transitioning from low esteem to self-managed care may not be realized. With reference to Pronk, Kottke, and Isham (2013), a complementary marketplace provider, community clinic, and support group advancing

care together may empower urban Indian health engagement and bolster patient activation.

Advancing Care Together

Chief among urban Indian health concerns is the lack of political constituency (Urban Indian Health Commission, 2007). Among the most troubling issues for urban Indians are the unfulfilled healthcare promises and the awarding of majority or larger minority political spoils (Jernigan, 2010) rather than to their underrepresented urban Indian constituents. Anderson and Olayiwola (2012) suggested an intervention capable of increased access and advancing care together while serving urban Indian community health centers and supporting patient-centered medical home collaboration.

A few examples of the related literature including (Davis et al., 2013; Philis-Tsimikas et al., 2012) have shown support for an integrated marketplace clinic, UIHO, and community-based diabetes support group collaboration. The American Diabetes Association (2014) Executive Summary report recommends an informed activated patient, team-based care, and community involvement to meet patient needs as a quality of care standard (p. 9). According to Pronk et al. (2013), clinical practices and community-based programs can work well together in advancing preventive care and improving health services outcomes.

Although the Affordable Care Act is intended to expand health care access for millions of Americans, many of whom are members of racial and ethnic minority groups, there is real concern that the universal access promise cannot be met for urban Indians (Jernigan, 2010; UIHI, 2014). Health service management systems researchers are

reminded by (Deming, 1986) that chaotic health systems cannot be expected to deliver quality health services (p. 414). Rather, it is hoped that the accountable and patient-centered health care applications depicted by Rittenhouse et al. (2009) will help guide quality care advancement, private/public health care partnership transformation, and will help progress toward universal health care access.

Conclusion

Anderson et al. (2007) characterized the Minneapolis Native American Community Clinic diabetes self-management as a best practice health service and commended the program for providing quality clinical and behavioral while serving disadvantaged racial and cultural minority populations. Core community empowerment and self-management concepts are seen to be aligning continuity-of-care, referral coordination, self-management support, and patient elements that offer key conceptual guidance for the design of this study empowerment (Anderson & Olayiwola, 2012). The Minnesota Department of Health (2011) report found public/private collaborations a valued addition to the health services delivery for minority and American Indian communities.

An innovative, albeit hospital business disruptive, marketplace clinic model, as described by Christensen (2009) could potentially coordinate high quality primary and behavioral care with best-practice urban Indian programs and complement diabetes care for urban Indians (pp. 118-120). If Minnesota marketplace clinics could extend access and provide patient-centered and accountable care, perhaps an effective complementary care system such as described by (“MinuteClinic Improves Access to Health Care

Services," 2010) could emerge. Although the Welty (1995) study was devoted to tribal American Indians, many related research grants and follow-up studies have been conducted by and for urban Indian communities ("Minnesota's Urban Health Care Safety Net, Grant and Loan Information," 2013).

The literature revealed a substantial body of evidence demonstrating that expanded primary care access and complementary diabetes support could be an effective intervention strategy. Community health centers and UIHOs have been providing medically underserved populations high-quality primary care and reducing health disparities for over 40 years (Egan et al., 2009). In Minnesota, as increased attention is now being focused on minority health and the Minneapolis urban Indian community has achieved greater political visibility. It would seem that there is a real opportunity to coordinate marketplace clinics and community-based support to activate self-management and improve the health and well-being of urban Indians, an often misunderstood, overlooked, and medically underserved population.

Chapter 3: Research Method

Introduction

This chapter includes information on the planned study design, the Minneapolis urban Indian diabetic's population sample, data collection, instrumentation, and protection of human subjects. The intended analytical focus was diabetes care capacity expansion, empowerment, and patient activation. According to the UIHI (2011), increased primary care access for the medically underserved Minneapolis urban Indian community is a critical need. The ADA (2014) described diabetes self-management education as an essential quality of care prerequisite. People with diabetes who have participated in a self-management program, compared with usual care control subjects, have demonstrated positive health outcomes and activation changes (Anderson et al., 2007; Hibbard & Greene, 2013; Lorig et al., 2009). My case-control research was designed to measure the effectiveness of marketplace clinics and APOD patient activation and diabetes prevention.

The literature search for American Indian diabetes care and self-management methodologies returned two main explanatory sources. Egan et al. (2009) described an effective behavioral intervention for cardiovascular disease and diabetes among the Plains Indians, and Anderson et al.'s (2007) real-world diabetes initiative demonstrated the value of integrating Minneapolis urban Indian behavioral and diabetes care. Additionally, some scholars considered self-managed programs to have had a positive effect on diabetes health outcomes (Hibbard, Mahoney, Stock, & Tusler, 2007; Greene & Hibbard, 2012; Remmers et al., 2009). These formative research references provided

evidence which pointed to an application of related research metrics and defined the shape of the design.

Research Design

To learn whether Minneapolis marketplace clinics such as CVS, Walmart, Target, or Supervalu stores could broaden health care access and complement urban Indian community-based diabetes prevention, I conducted a case-control study to evaluate marketplace clinics and APOD program effectiveness. Study emphasis was given to measuring the collaborative programs combined empowerment, social support, and activation effect.

Integrated medical and behavioral care, as well as diabetes self-management education, is basic ADA quality standards of care (ADA, 2014). However, because the problem of diabetes in the population persists, and the marketplace clinics provide treatment for 15 minutes or less, the time may be inadequate for effective behavioral support or continuity of care. This study was designed to evaluate whether a complementary and integrative health services delivery program, such as the marketplace clinics and APOD collaboration, could strengthen the patient's actualization role in managing his or her own diabetes.

The Stanford Chronic Disease Self-Management Program (Lorig et al., 2009) has been adapted by community-based APOD. The UIHOs employ an IHS diabetes education curriculum. The Lorig, Holman, and Sobel (2012) Living Well with Diabetes and Hibbard and Greene (2013) PAM programs were applied by the APOD diabetes support group. The APOD adaptation is based on self-efficacy theory and emphasizes

problem solving, decision making, and confidence building (Albee, 2012). Health behavior, self-efficacy, and health activated status indicators were the main outcome measures to be assessed at baseline and at 3 months post intervention by PAM self-administered questionnaires. The research project was built upon the premise that successful diabetes management depends on the accessibility of clinical care and the patients' ability to set goals and make healthy clinical, social, and personal choices. According to Sheldon, Williams, and Joiner (2008), diabetes self-management requires that patients acquire considerable health education. Persons with diabetes also need to adapt life style changes including diet, exercise, and medications. Moreover, diabetics must learn to continuously monitor and cope with complications of the disease, not just in the short run, but also for the rest of their lives (Sheldon et al., 2008, p. 83).

The PAM survey instrument was used to measure self-reported responses to health motivational questions (Hibbard et al., 2004). The Hibbard at al. (2004) PAM survey conceptual definition of health activation in patients and consumers is that

> Those who are activated *believe* patients have important roles to play in self-managing care, collaborating with providers, and maintaining their health. They *know* how to manage their condition and maintain functioning and prevent health declines; and they have the *skills and behavioral repertoire* to manage their condition, collaborate with their health providers, to maintain their health functioning, and access appropriate and high-quality care. (p. 1010).

In this research, I presumed that diabetes self-care empowerment, community-based support, and patient activation processes combine to produce a diabetes self-management

educational intervention for South Minneapolis medically underserved persons, including urban Indians.

The basis of this experimental design was that the synergistic effect of this empowering, supporting, and activating collaborative has the potential to increase the ability of the population to think critically and act in their own self-determined best interest. According to Funnell and Anderson (2004), an enhanced sense of empowerment occurs as a result of diabetes self-management education. For purposes of design, Anderson and Funnell (2010) explained that empowerment is a continuous variable which measures the strength and direction of change as an indication of an educational intervention's effectiveness (p. 280).

There were a number of constructs underlying my research design. Building upon the Funnell and Anderson (2004) empowerment concept, Hibbard and Greene (2013) and Insignia Health LLC created and copyrighted the PAM 13-item short form and analysis methodology (shown as Appendix C). In this study, I applied the PAM in part to analyze an ADA standard of medical care which measured the ratio of change observed in the independent blood sugar (i.e., an A1C measure relative to 7.0 where below 7 is good diabetes control and above 7 is poor control). ADA (2014) recommended behavioral support groups as critical diabetes care components. More positive treatment and improved diabetes care could result from a combination of more marketplace clinics and activated support groups. Just how reliably the PAM measurements interrelate with the general theoretical framework determined design (or construct) validity (Frankfort-Nachmias & Nachmias, 2008).

The case-control design was aimed at quantifying the extent to which the independent variables (community empowerment and activated diabetes self-management education) improved blood sugar A1C, BMI, and BP as well as produced positive health outcomes.

The PAM validity, reliability, and usability is attested to by 170 PAM licensed research studies published within the past 5 years. According to Hibbard et al. (2004), validity is defined as the appropriateness, meaningfulness, and usefulness of inferences made from test scores. By this measure, the PAM instrument was considered valid and was so determined in several ways. Content validity is defined as "covers all the attributes of the concept you are trying to measure" (Frankfort-Nachmias & Nachmias, 2008, p. 149). Establishing content validity of the original Hibbard et al. (2004) PAM tool involved a literature review, expert consultation, and focus group consensus to establish activation domains. The domains were operationalized by selecting and piloting 80 questions from existing instruments and creating new ones. All 80 questions were reviewed with 20 respondents with chronic conditions for clarity. A pilot study was then conducted, and then after using the Rasch methodology, 22 items were deemed appropriate for the scale (Hibbard et al., 2004). An item reduction analysis was completed that resulted in a 13-item measure that had biometric properties similar to the 22-item version (Hibbard et al., 2005).

In the conduct of my research, I applied the Hibbard et al. (2005) PAM-13 to investigate the extent to which Minneapolis marketplace clinics extended their business model, complemented community-based diabetes support to be inclusive of urban Indians

with diabetes. The PAM research design aspects included testing a null hypothesis where there is no significant difference among A1C, BMI, and BP case-control group mean values. In my research analysis, I considered the following question: To what extent do marketplace clinics commit their medical business models to complement community care, A1C, BMI, and BP clinical indicators, and APOD applied PAM survey response variables?

The PAM short form poses a series of closed-end questions that allow respondents to answer how assuredly they are that they can self-manage their own diabetes. The first two PAM survey items are:

1. When all is said and done, I am the person who is responsible for taking care of my health.
2. Taking an active role in my own health care is the most important thing that affects my health.

The PAM is scored from strongly disagree (1) through strongly agree (5), a scale used in diabetes self-management programs. The next six items are confidence statements:

3. I am confident I can help prevent or reduce problems associated with my health.
4. I know what each of my prescribed medications do.
5. I am confident that I can tell whether I need to go to the doctor or whether I can take care of a health problem myself.
6. I am confident that I can tell a doctor concerns even when he or she does not ask.
7. I am confident that I can follow through on any medical treatments at home.
8. I understand my health problems and what causes them.

The three diabetes patient or participant activation statements are:

9. I know what treatments are available for my health problems.
10. I have been able to maintain (keep up with) lifestyle changes, like eating right or exercising.
11. I know how to prevent problems with my health.

The final two statements pertain to the participants' higher and more sustainable activation level:

12. I am confident I can figure out solutions when new problems arise with my health.
13. I am confident that I can maintain lifestyle changes, like eating right and exercising, even during times of stress.

To test the lifestyle intervention effect, I applied the PAM 13 diabetes clinical and lifestyle scale.

The Greene and Hibbard (2012) PAM knowledge, skills, and confidence survey items were reviewed by UIHO, APOD, and UIHI researchers and are included in the survey. The PAM survey instrument was used to quantify elements of access, cultural awareness, and continuity of care. Also included was an evaluation of the marketplace clinic's reciprocal care capacity to complement community-based diabetes services. The empowerment, self-efficacy and activation effect was summarized with respect to a person's ability to ascribe his or her degree of agreement with the statements such as those posed by the Hibbard et al. (2004) PAM survey. The PAM instrument is an off-the-shelf standardized scale which is scored along the continuum of 1 = strongly disagree, 2

= disagree, 3 = N/A or neutral, 4 = agree, and 5 = strongly agree. The scoring of these metrics allows analytical comparison among participant and nonparticipant groups.

Should the questionnaire summary review find considerably more positive case responses, that result would be indicative of good internal consistency. Conversely, it is expected that control clinic visit experiences and support group responses will be significantly less consistent and hypothetically rate lower on the PAM-related scales.

For urban Indians, community-based diabetes education is an important intervention. Diabetes empowerment scales and clinic satisfaction surveys returned individual and aggregate scores. Quarterly blood sugar (or A1C) testing quantified certain measures of compliance and lifestyle commitments during a 3 month period. For marketplace clinics and APOD intervention group, it was found that most participants reported favorable experiences.

The quantitative study sample (N= 135) was found to have sufficient power to measure the self-efficacy effect, which occurred as a result of marketplace clinic and APOD support group participation. According to the Minneapolis Quick Facts from the U.S. Census (2010), the Minneapolis inner-city population within Hennepin and Ramsey Counties included approximately 20,000 urban Indians. The Hennepin County Community Health Department (2002) reported a 15.1% American Indian diabetes rate. Therefore the number of urban Indian persons with diabetes was calculated at 3,000.

Based upon Mr. Robert Albee, APOD director's estimate of 2014 attendance, there were 140 APOD participants. Of these, approximately 35 medically underserved and urban Indian persons regularly attended APOD weekly meetings. Another 15

principally NACC affiliated urban Indian persons who routinely participate in the sponsored lunch and breakfast diabetes education programs. Pre and post PAM surveys could be conducted for these 50 regulars who could therefore comprise the study group. The control group could be comprised of a like number of UIHO diabetic patients.

Examination of the literature from five PAM related studies yielded an estimated Cohen's *d* effect size of 0.65 (Greene & Hibbard, 2012; Lorig et al., 2010; Remmers et al., 2009; Solomon, Wagner, & Goes, 2012; and Stombaugh, 2010). Using a generally accepted sample size determination (Harlow, Burkholder, & Morrow, 2002), the number of participants needed was calculated at 95% confidence and 0.80 power. The two sample groups were:

1. APOD group repeated pre- and post- intervention. The needed related sample size was determined to be (n_1 = 24 + 20% = 30 participants).
2. Case-control (APOD - UIHO) group comparative differences by diabetes outcomes (A1C, BMI, and BP). The APOD needed sample size was (n_2 = 40 + 20% = 48 participants). The UIHO control group was comprised of 87 participants.

Because of the socioeconomic difficulties faced by the population and the limited follow-up communications aspect, a 20% "buffer" was added to help minimize attrition.

There was also be a separate focus on the several study participants who strongly disagreed with PAM questions. These negative findings provided useful insights into how the clinic program and support groups operated (Creswell, 2009). Those who responded in the negative may have had traumatic experiences or legitimate concerns limiting their

capacity to empathize with the diabetes care experience (Myhra & Wieling, 2013). I reviewed these results with study group leaders and gave feedback to the group decided gained consensus regarding negative readiness-to-change patterns.

The research intervention variables were marketplace clinics, capacity expansion, community health empowerment, diabetes self-management education, and patient activation and their relationship with medically underserved populations and urban Indians accessing high quality diabetic care services. Marketplace clinics and their community-based support group programs were compared with usual-care control groups to determine whether they (a) demonstrated reduced A1C, BMI, and BP; (b) have improved self-efficacy; and (c) had shown more activated self-care.

The study employed quantitative case-control statistical analysis. The case-control groups included medically underserved and urban Indian diabetes patients receiving care at marketplace clinics and other clinics both with and without a community-based support group. In addition to the usual clinic, and support group designations, the variables included A1C% at test date (year/month), BMI, BP, and the patient-activation score, which was measured on a Likert-type scale (Likert, 1932). The Walden University Institutional Review Board (IRB) approval number for this study is 02-11-15-0170571. In accord with IRB privacy and ethical practice guidelines, I did not include direct observation of provider-to-patient interaction. All data was secondarily referenced to the Hibbard and Greene (2013) PAM survey under the auspices of APOD.

The Role of the Researcher

Engaged in community-based participatory research, my role was as researcher and analyst of APOD survey data that was collected by the Patient Activation Method (Hibbard & Greene, 2013). Consultation with the APOD director and regular attendees led to the application of the Hibbard and Greene (2013) patient activation measurement and motivational interviewing survey sets. The Likert-type instrument provided quantification of diabetes self-efficacy and self-management activation aspects. Using SPSS, I conducted a case-control examination of marketplace clinics and APOD diabetes support group provision of quality diabetes care.

Using the Hibbard and Greene (2013) PAM survey and APOD administered research data, I conducted a case-control review of the collected baseline and intervention-activated diabetes data. The Hibbard and Greene (2013) questionnaires were alpha-numerically coded by cases (known marketplace clinics with an APOD community support group) or controls (an UIHO clinic and support group with no therapeutic connection to the research participants). The case-control study included an evaluation of the extent to which increased complementary care empowered community-based self-management education and expanded urban Indian health care access. This research strategy was used in an investigation of the influence of knowledge, attitudes, and behaviors thought to be associated with demographics, lifestyles, and health status variables.

Data Sources

I have secured a PAM license and agreements to access published UIHI reports and a secondary data use agreement with APOD to gain release of de-identified survey data. Using that data, I determined the relative diabetes clinic quality, empowerment, and patient activation effectiveness. The APOD participants, APOD director, NACC Diabetes Prevention Program coordinator and the UIHI director have indicated an interest in the proposed research. The APOD director provided a secondary data use agreement (Appendix D).

A Greene and Hibbard (2012) study conducted at the Fairview, University of Minnesota Hospital suggested that patient activation contributed to better health outcomes in that high patient activation is thought to advance a person's knowledge, skills, and confidence in managing health and health care. At the low end of the patient activation scale, people are typically passive recipients of care and do not take an active role in their own care. At the high end of the activation scale, people are proactive about their health and engage in many recommended health behaviors.

The study group is comprised of the marketplace clinics and APOD members who participated in the blood glucose, hypertension, and weight management program and completed the pre- and post-PAM survey. The intervention is the collective opportunity of helping one another and cultivating physical activity, better diet, not delaying seeking care, empowered consumer behaviors such as preparing a list of questions for a doctor visit, and patient-activated self-management practices such as keeping a diary of blood glucose readings.

The control group was selected from a similar inner-city marketplace and UIHO service area. The difference is that the control group will not have received the community-based APOD complementation and PAM activation. The most recent Urban Diabetes Care and Outcomes Audit Report (2014) for UIHOs was referenced for comparative evaluation. After receiving the intervention and control group data, I conducted statistical significance testing to analyze the clinical (A1C, BMI, and BP) group mean differences.

Criteria for Selecting Participants

The participants were selected from a cross cultural Minneapolis community of medically underserved and urban Indian persons with diabetes. Whereas most studies of Native Americans with diabetes were conducted for reservation populations, the results of this study will add to the literature for this largely unstudied medically underserved group. Adult diabetic and pre-diabetic persons who had been told by a doctor that they had elevated blood sugars were invited to participate, and potential participants were asked if they wanted to be part of a research study that requires completing a brief survey. Participants were recruited from the Minneapolis urban Indian neighborhood through postings, newspaper notices, and social media announcements. Diabetes Awareness and Community Health Promotion Flyers about the study were posted throughout the urban Indian community in area marketplace clinics and stores, as well as in the entry area, dining room, and waiting area of the Phillips Community Center (Appendix A). Participants were mostly Minneapolis Phillips neighborhood residents.

Procedures

Conducted as applied research, my study design was aimed at assessing whether more inclusive access, integrated health services, and complementary case management was delivered by APOD and the neighboring marketplace clinics. During the process of my community field work, I secured a data use agreement from the APOD director (Appendix D). I also, referenced the published UIHI (2014) Urban Diabetes Care and Outcomes Summary Report. Utilizing this information, my case-control study was conducted to assess patient activation and attendant data (A1C, BMI, and BP). The study was conducted collaboratively with community and corporate stakeholders; while we worked with and learned from health care practitioners.

Data Analysis

During the conduct of the study, I analyzed the various diabetes-related clinical and behavioral care survey responses as shown in table 3.

Table 3

Clinical and Behavioral Care Survey Response Variables

Variable Name	**Variable Description**
Participant ID	Coded as Study or Control by usual clinic and support group designations GrpS1-99, or GrpC1-100.
Attendance Date	Shown as week 1 thru 52 of calendar year 2011 - 2014.
A1C% at test date	Change shown over three three-month periods.
Blood Pressure (BP)	Systolic blood pressure readings (below 140 threshold) and diastolic blood pressure readings (below 90 threshold) per recorded week.
Body Mass Index (BMI)	Weight and height with calculated BMI change shown as average, difference, and percent change over first four weeks APOD attendance and the last four weeks.

Patient Activation Measure (PAM) score	The PAM survey response score was measured on a Likert-type scale (Likert, 1932) of 1 – 100 points reflective of the participants' knowledge, skills, and confidence level.

The Hibbard (2004) measurement instrument was the licensed (Appendix B) Patient Activation Measure – PAM (Appendix C). The PAM instrument ranked diabetes care knowledge, skills, and confidence structured survey responses along a Likert-type scale (Likert, 1932). Hibbard et al. (2005) described the four health management levels as the participant:

1. Believes an active role is important but lacks knowledge and confidence.
2. Has confidence and knowledge to initiate action.
3. Is taking action.
4. Achieved necessary behavior changes and striving to sustain under stress.

The collected data included marketplace or other clinic, support group, A1C %, BMI, BP, and PAM survey response selections at pre and post intervention.

The Hibbard and Greene (2013) PAM 13 item instrument is calibrated on the amount of activation that was required to endorse the item and direct the motivational interviewing (Hibbard et al., 2005). My study tested the null hypothesis that pre- and post-intervention case group means are equal to the comparison group means. I also utilized retrospective data to examine the extent of motivational commitments from Minneapolis urban Indians to access quality health services and marketplace clinic organizational reciprocation.

Protection of Human Rights

In coordination with APOD, I secured permission from participants, explained the time commitment, and described the research value. The research study participants experienced no particular physical, emotional, or other untoward participation affects. In discussion with the APOD director and active members, it was considered that a person's Indian blood quantum or a percent of American Indian ancestry was too controversial (Haozous, Strickland, Palacios, & Solomon, 2014) and this matter was not included as part of the research. In compliance with Committee on Science, Engineering, and Public Policy (2009) standards, research planning and application conduct was observed and the research protocol including informed consent, privacy, and data confidentiality provisions was followed.

Summary

My study consisted of an analytical examination of marketplace clinics and APOD effectiveness as a function of self-management education. Case-control groups were marketplace and other clinics with or without a support group. The research queried whether Minneapolis marketplace clinics complemented and expanded care for medically underserved and urban Indian persons with diabetes. The quantitative methodology evaluated participants' pre- and post-survey information regarding their diabetes care. The research study also assessed diabetes patients' knowledge, activation, empowerment, and clinical information.

The retrospective study was intended to measure the complementary effect that marketplace clinics have with urban Indian health clinics and the extent that community

support group participation improves diabetes health outcomes. The case-control groups are urban Indian patients receiving diabetes care at marketplace clinics or other clinics with/without a diabetes support group. Under the auspices of the community-based APOD support group, I examined the relationship between marketplace clinics expanded diabetes access and diabetes support group influence that was associated with health outcomes and patient activation. The proposed intervention is the complementary effect that marketplace clinics have with urban Indian health clinics and the extent that community support group participation improves diabetes health outcomes, will be conducted in Chapter 4.

Chapter 4: Results

Introduction

In this study, I evaluated the effectiveness of a community-based diabetes support group (APOD) compared to a federally sponsored clinic program for diabetics (UIHO). The study was conducted over the past 3 years. The main research question was whether the complemented APOD study group members managed their blood glucose trends better than the nonparticipating UIHO control group members did. Affiliated research questions considered whether the APOD case group's PAM scores and attendant data (A1C, BMI, and BP) improved. The null hypothesis was that there is no difference in diabetes self-management trends (A1C) between case and control groups. The null hypothesis was rejected, and the alternate hypothesis was selected; the APOD case group, having taken part in the PAM motivational interviewing and diabetes self-management education, did show greater diabetes health improvement than the comparison UIHO control group.

The case-control study results addressed the primary and two secondary hypotheses described in Chapter 3. The marketplace complemented APOD group influence (independent variable) on clinical outcomes (dependent variables), with the primary focus on the inferential statistical tests used to examine research hypotheses. Chapter 4 results are organized into six sections. The community health promotion and participant group assignment process, is described, as follows

1. Report of the community partner agreements and data access procedures.
2. Preliminary data analysis to assess the key outcome variables accuracy and equivalency with respect to case-control groups.
3. Presentation of the (PAM) instrument properties and application.
4. Results of the three hypotheses tests.
5. Retrospective study summary.

Case-Control Study and Data Development

This case-control study involved two Minneapolis inner-city diabetes prevention groups. The APOD case group was formed in 2010, with meetings and events formerly held at the Minneapolis American Indian Center and conducted much of its diabetes prevention programming with the Native American Community Clinic. In 2012, the APOD group received Allina Health Services funding support and moved into its present Phillips Community Center location (Community at the Core: Backyard Initiative, 2014). The UIHO control group (Indian Health Board of Minneapolis) was formed in 1971 with IHS and U.S. Public Health Service financing. The clinic is one block southwest of the Phillips Community Center. The UIHO control group currently coordinates many of its diabetes outreach events with the Minneapolis American Indian Center. Both groups are centered in the Minneapolis Phillips medically underserved area and are near several marketplace clinics as described in Chapter 1.

Research Participants

The retrospective study encompassed the Minneapolis Phillips medically underserved area and census tract clusters heavily populated with urban residing

American Indian persons. Adult diabetic and prediabetic individuals who had been told by a doctor that they had elevated blood sugars were invited to participate. Inclusion criteria were documented during intake and during the retrospective study as participants had their diabetes blood sugar (A1C), BMI, and BP data recorded. Because the participants' diabetes programs pre-existed as a matter of natural group alignment, nonprobability sampling was employed.

Complementary Network

Secondary case data and published control data were gathered for purposes of research analysis. Case participant information was derived from APOD and participating marketplace clinics diabetes patients. APOD's diabetes self-management effect is described by the Community at the Core: Backyard Initiative Assessment Report (2014). The APOD program grew from a network of family, social, and community-based resources that effectively complement the work of health care providers.

Prompted by experience in the field during the study development and data collection phases, the sample frame was modified; participant identification numbers were assigned; and community promotion, networking, and group assignments were developed. The research process flow, procedures, and actual number of participants at each major step of the study are shown in Figure 3.

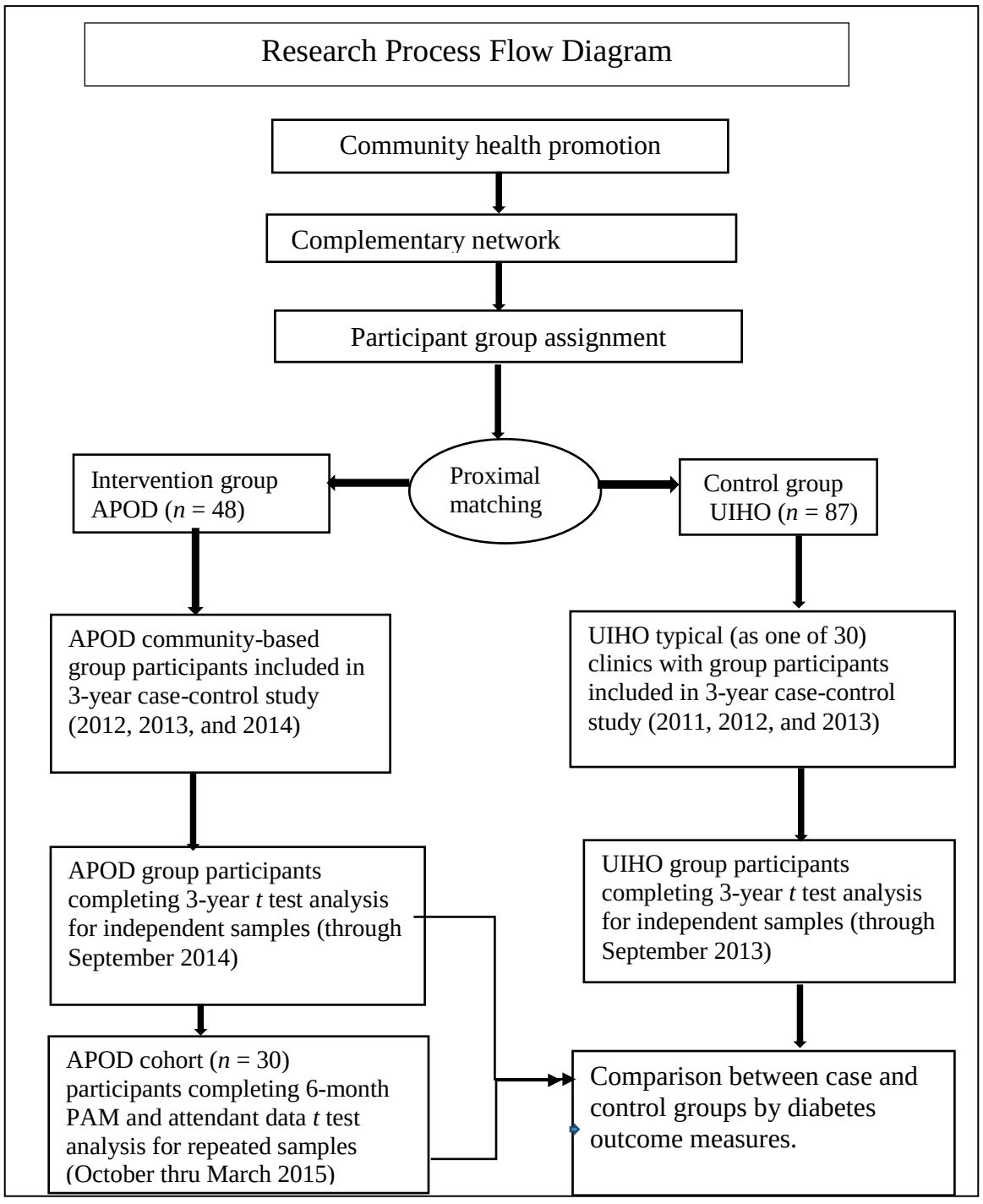

Figure 3. Study development, participants, and process flow diagram

Group Assignments

Over 100 flyers describing the urban Indian diabetes prevention programs were posted in area marketplace clinics, shopping areas, and other neighborhood gathering places. As described in Chapter 3, diabetes participant group alignment either already existed or had been populated according to the community health promotion campaign. Group assignments occurred naturally over the past several years, as participants aligned financially and culturally with the program of their preference.

Based upon the Albee (2014) attendance estimate, 100 potential APOD participants were identified. Of these, 50 medically underserved and urban Indian persons regularly attended APOD weekly meetings and actively participated in the sponsored lunch and breakfast diabetes education programs (Appendix E). I conducted pre- and post- PAM surveys for these 48 study group participants.

The IHS (2011) report to congress described the UIHO controls group. Core elements of the IHS special diabetes program are participant recruitment, screening, and enrollment (n = 48) per year were described, as well as the diabetes prevention curriculum. In 2011, there were 2,610 participants at 30 UIHO clinic sites (p. 35). The control group was derived from one of 30 total clinics and represents a typical UIHO (n = 87). The UIHO program applied case management, medical care, and patient education strategies to change risk behaviors and improve clinical measures in people with diabetes. The case-control programs at baseline were similar, with both providing monthly individual lifestyle coaching for physical activity, nutrition, and weight loss.

The PAM survey was reviewed with Hibbard's (2013) Minneapolis Insignia Health designate followed by a planning meeting with APOD. The APOD director and I reviewed secondary data use agreement, inventoried the de-identified PAM and attendant data, and finalized the data transfer. Confidential data release (per de-identified paper copies) followed the guidelines of the APOD director for this research, including secure storage, processing, analysis, review, and reporting.

Study Procedures

Pursuant to the APOD secondary data use agreement, I reviewed a limited data set with particular focus on determining that study participants had received education information, provided informed consent, and that collected data were managed and released per APOD secondary data use and PAM licensed agreements. All received data were processed and saved on my password-protected PC. These measures are consistent with Walden IRB ethical and privacy standards. In accord with limited data usage agreements, participant PAM, and attendant data were de-identified and transferred to my PC. To protect the individuals' health information and comply with HIPAA, IRB, and related regulations, records were identified by number only.

At the time participants completed their PAM survey, I had approval to receive survey and attendant data (A1C, BMI, and BP) from APOD's director. A 4-character alphanumeric system was used to cross-reference participants' identification numbers. Participants' files are maintained in APOD's locked files, with only de-identified copies released to me. These PAM and attendant data points were subsequently transferred according to the Insignia Health, LLC (2015) valid copyright license agreement to my

password-protected computer. The PAM automated spreadsheets and careful file management minimized the risk of errors during a process of reconciling the identifiers with participant records.

At the conclusion of the 3-year study, the community partner, APOD, administered the PAM survey. All case participants who had not dropped out were given the PAM posttest survey. The posttest survey was completed by 30 intervention group participants at the end of the study year 2014 and the first 2 months of 2015. From APOD program inception in early 2011 to completion of the posttest, the attrition rate for this study was somewhat higher than the 20% that was anticipated. An analysis of the individuals dropping out of the study compared to the participants completing the posttest survey appears in the group means differentiation section later in this chapter.

APOD collected case data for this study according to the secondary data use agreement described in Chapter 3. Comparison control group data were obtained from the UIHI (2014) aggregate diabetes results. Case and control measures were extracted and loaded onto my computer. Survey and attendant data were input to an Excel spreadsheet (Appendix K) and made ready for the standard file format used by the SPSS 21 (Green & Salkind, 2011).

I manually transferred the data from the APOD participant charts to a Microsoft Excel worksheet which contained the weekly usage statistics for each intervention participant. Data transfer occurred upon the APOD director release of redacted personal health information. A five-character identification code was previously created and provided as a cross reference. Protected health information exchange between the

community partner and me was conducted per HIPAA regulations. All references to participants were by identification number only.

Ascertaining Quality

During my preliminary data review, I determined that a classical experimental design was not a good fit for my nonrandom sample population. There were also questions regarding the studied variables normal distribution. Thus I considered employing a quasi-experimental design for my study. Shadish, Cook, and Campbell (2002) provided strategies for quasi-experimental studies which enable quantitative researchers to go beyond classical randomized experiments and develop inferences for generalized populations. When conducted as community-based applied research, a particular reliance is placed on proper data collection and validation (p. 19). For my secondary data use, quality research procedures and edit checking ascertained datasets accuracy.

Data Scrub

Prior to applying statistical methods or exploring variances among cases or between groups, data quality problems were reviewed and resolved (Anderson-Cook, 2005). Consistent with Deming's (1986) management principles, it is better to ensure high-quality input than to wait until the end of the process to find defects. Visual inspection of the 70 pre- and 60 post- PAM surveys and attendant data revealed three pre- and one post-case with response items containing not applicable (N/A) and two cases with unclear recordings.

PAM licensing administrator, Insignia Health Patient Activation Measure®, (2015) recommend that N/A responses be treated as missing data. In like situations where there are relatively few missing data, Green and Salkind (2011) allow the substitution of surrounding item means to replace the missing items in the process of calculating the patient activation score (p. 133). Preliminary data scrubbing resulted in 48 surveys comprising the APOD case sample set.

My password-protected home office computer stored the flash-drive copied APOD secondary data and analysis results. Security provisions were also taken to protect these data during initial data collection, data transfer, and archiving (e.g., privacy envelopes, password protection, locks). The transferred data were de-identified, and the study and control group data/keys were password protected and otherwise secured. APOD clinical and PAM survey secondary data were released and reasonability checked per the data use agreements described in Chapter 3. UIHI (2014) summary level control data reports were also reviewed. Original case records reside with APOD, and control records are made publically available by UIHI. My Walden University research data are password protected and will be locked for 5 years. At the end of that time, all data will be shredded**.**

Validity Threats

Frankfort-Nachmias and Nachmias (2008) consider quasi-experimental, nonequivalent groups design takes best advantage of the situation where there is pre-existing assignment of participants (p. 118). Although optimal validity comes with

random participation, Frankfort-Nachmias and Nachmias (2008) find nonrandom categorical groups design appropriate and generalizable for most field studies.

Methods and Measures

The purpose of the quantitative study was to compare the motivational and activation effect that resulted from participants involved in two different diabetes care programs. This chapter discussed a claim made about two population group means and evaluated whether the mean of the APOD intervention group differed significantly from the mean of the nonintervention UIHO group. A quasi-experimental research methodology was used to test whether the marketplace complemented APOD group was appreciably better or worse than the UIHO group, with respect to self-care activation and clinical outcome measures (A1C, BMI, and BP).

Motivational Interviewing and Activation

Led by an informed APOD facilitator and engaged in self-help and support of one another, motivated and activated participants were coached in diabetes self-care and behavioral modification. Hibbard and Cunningham (2008) described motivational interviewing as that coaching technique useful for assessing participants' readiness-to-change and for promoting progressively higher activation levels. The Insignia Health (2015) PAM website, describes four levels of activation:

1. Predisposed to be passive,
2. Building knowledge and confidence,
3. Taking action,
4. Maintaining healthful behaviors and pushing further.

The PAM instrument was used to conduct motivational interviewing and survey the personalized-diabetes-health questions (Hibbard & Cunningham, 2008).

Applied together with the Stanford DSM education, the combined program has been shown by Minneapolis-based Fairview University Health Systems to be an effective and sustaining program (Greene & Hibbard, 2012). As quoted in the Minneapolis area *Circle* newspaper, Albee (2012) stated

> We come mostly from ‘mostly inspiration,' not from an academic background. Innovation comes from people willing to take risks. . . . It's not a medical model at all, it's a community model, and some would call it a "*promotoras*” (Latin for lay health educators) model in some ways. In other words, villages have always kept people healthy. We learn by indigenous wisdom and experience.

APOD participants echo the advantages that such peer-to-peer dialog has over the traditional medical system model where the doctor sits the patient down and lectures them (Albee, 2011).

It was postulated in Chapter 1 that the communicative aspects of sharing stimulates caring and motivates lifestyle improvements that would not occur otherwise. Research articles on the subject of patient activation present evidence showing how participant attitudes were observed to change within a very low to very high (1-5) level in response to motivational interviewing and patient activation (Chapter 2). In this study, PAM survey responses were observed to change, nearly one full level, from a proficient level 2 to a well skilled self-management level 3.

American Diabetes Association (A1C) Standard

The main studied metric was the American Diabetes Association (A1C) standard of less than 7.0 (ADA, 2014). A1C is a measure of the percent of blood glucose attached to a hemoglobin molecule and an indicator of the past 3-month lifestyle and self-management control (Krishnamurti & Steffes, 2001). The A1C laboratory test is defined as the primary predictor of development or reversal of diabetes complications (Chapter 1). Pre- and post- measures also included body mass and blood pressure indicators.

Patient Activation Measure (PAM)

Insignia Health, LLC (2015) reports that the PAM-13 questionnaire is a highly regarded, valid, and reliable instrument applied to over 180 organizations worldwide including a prominent Minneapolis study (Hibbard & Greene, 2013). PAM author, Dr. Judith Hibbard, authorized my Insignia copyrighted licensed use (Appendix B), and I have in turn a PAM and attendant data use agreement (Appendix D) with APOD (Chapter 3). Over the past 4 years, approximately 50 participants consented and completed patient activation survey sheets with the last 30 surveys collected under a licensed PAM agreement. The 13 PAM questions (Appendix C) required only 10-15 minutes to administer. My PAM study with the community partner (APOD) had a sample size of n = 30. The PAM survey and attendant data were gathered from six months pre- and post-PAM survey completed in March 2015.

Research Tools

The applied research toolbox was prepared in accord with the Deming (1986) systems approach, which is often referred to as the plan-do-study-act (PDSA) quality

engineering cycle. Placing the consumer first, or, in this case, the study participant first actually strengthens research design and application. Achieving high-quality results also depends on employing the most up to date and useful tools of the trade (Deming, 1986, pp. 130-132). Whereas a purely experimental design was planned, upon further study it became apparent that research methods re-tooling was necessary. With reference to Simon and Goes (2013), I investigated alternative quasi-experimental strategies which have application for nonequivalent groups (p. 94). Shadish et al. (2002) describe causal inference evaluation and suggest researchers first examine the case-control sample distributions to rule out any obvious differences (p. 15). Within this diabetes care study, the APOD case and UIHO control group values such as A1C, were found to be evenly distributed with similar standard deviations. Figure 4 displays the APOD case group A1C distribution, and Figure 5 describes the UIHO control group A1C distribution, as shown on the following pages:

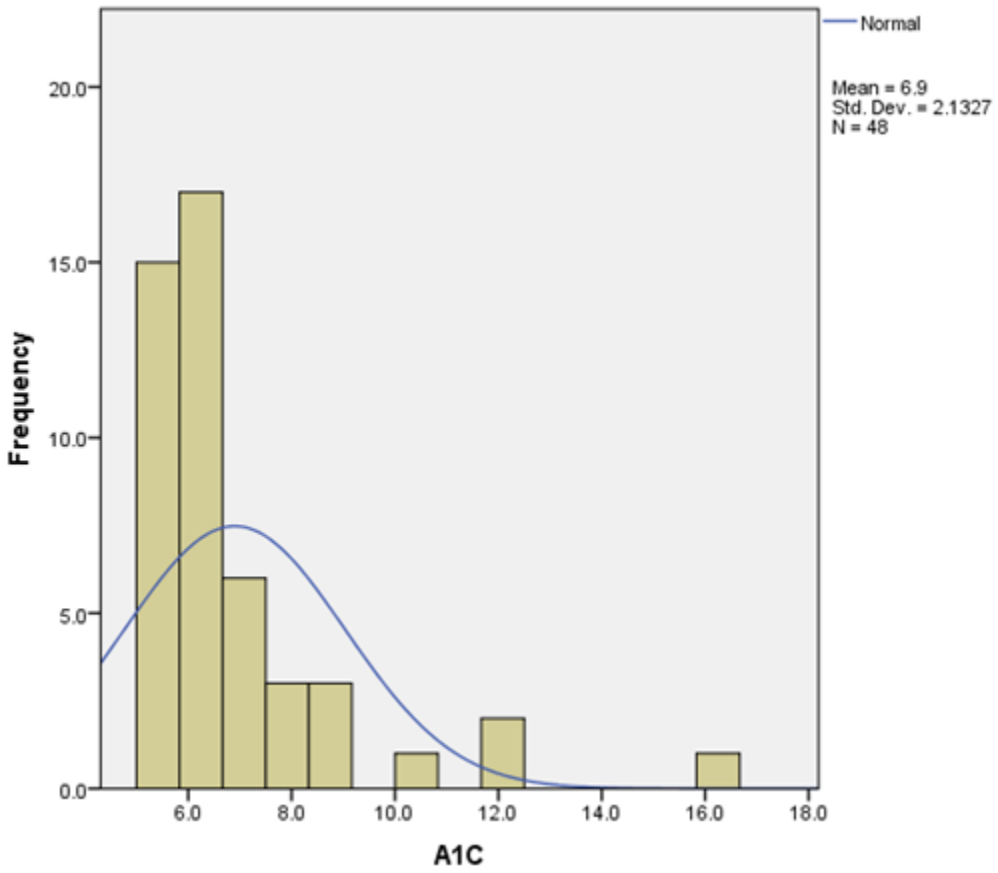

Figure 4. APOD case- group means by A1C distribution

The A1C distribution describes categorical group mean differences (Simon & Goes, 2013, pp. 93-94). The UIHO control group A1C distribution is shown as Figure 5 on the following page.

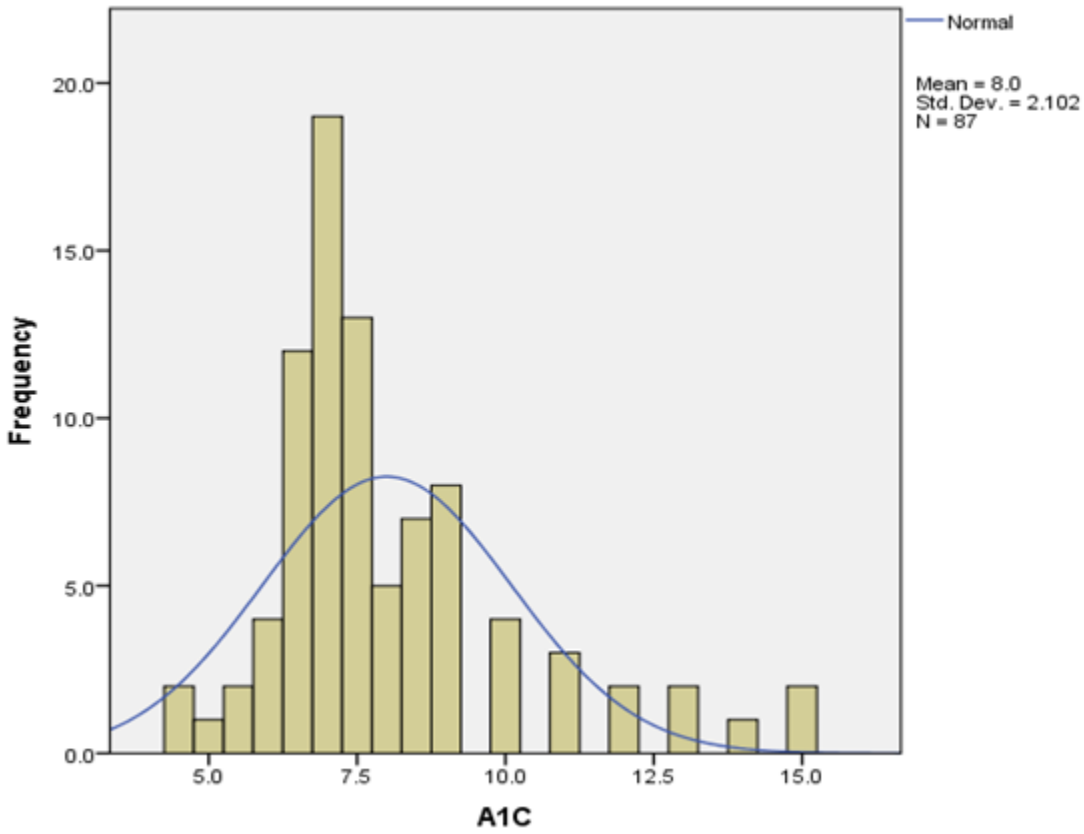

Figure 5. UIHO control group mean by A1C distribution

Description of the Sample

According to Frankfort-Nachmias and Nachmias (2008), nonrandom population sampling bias can be minimized by the combined use of contrasted groups and control series designs (p. 130). For this quasi-experimental study, I found sample similarity between the community-based APOD and neighboring UIHO categorical group means. The expected PAM effect size was based on information from five pertinent articles (Greene & Hibbard, 2012; Lorig et al., 2010; Remmers et al., 2009; Solomon et al., 2012; Stombaugh, 2010). The PAM effect size compilation is shown in Appendix F. The combined statistical tests determined a slightly above medium effect size. This effect size calculation justified the sample size calculated in Chapter 3.

The medium (d = 0.65) effect size, statistical, power, and anticipated attrition were the primary factors considered in sample size calculation. With reference to Green and Salkind (2011), sample size for a 95% confidence level and 0.80 power, the *t* test for independent samples) yielded an 80 participants sample with 40 members each divided among the two groups (pp. 170-171). Because of the health access difficulties of the population socio-economic limitations, a 20% buffer added to the case group (or 8 additional participants) was added to help minimize attrition (N = 48 cases + 87 controls = 135 members).

Statistical Significance Testing

Marketplace complemented (APOD) was the intervention group, and usual care (UIHO) was the comparison group. The APOD intervention group employed motivational interviewing and PAM in coaching diabetes self-care and behavioral modification (Hibbard, 2004; Hibbard et al., 2005). The UIHO control group received only primary diabetes self-management education and prevention materials. With reference to Creswell (2009), *t* tests and effect size measurements were used to quantify the size of the difference between this study intervention and the comparison group (p. 157). *T* tests were used to measure strength of association between means. Use of an effect size conveys the same information as statistical significance, but with the emphasis on the effect impact rather than the sample size and statistical significance.

Intervention Effect

An approximate effect size is considered a valid estimation underlying sample size calculation (Cohen, 1988). Defined in terms of population means and a standard

deviation (SD), effect size is calculated as [d = absolute value of (mean1-mean2) / standard deviation] where d is Cohen's d (Cohen, 1988, p. 274). Creswell (2009) stated that the "effect size" identifies the strength of conclusions about group differences or the relationship among variables in experimental statistical analysis (p. 167). As a practical matter, effect size facilitates interpretation of the substantive as opposed to statistical significance.

Group Means Differentiation

The first focus was on study participants and the effect of a marketplace-complemented diabetes support group APOD (the independent variable) on patient activation and attendant clinical outcomes (the dependent variables). Next, the (Appendix G) data were analyzed to measure the size of the APOD self-management intervention effect compared to the UIHO control. The results are shown in table 4.

Table 4

Case-Control Group Means Comparisons by Outcome (3-Year)

Group	***N***	**A1C**	**BMI**	**BPsys**	**BPdia**
APOD Cases (2011-2014)	48	6.9%	32.09	127.00	80.04
UIHO Controls (2011-2013)	87	8.0%	34.68	127.35	80.35
Difference/*SD*	135	-1.1/2.17	-2.59/ 6.69	-.65/10.99	-.31/10.90

Note. SD = Standard Deviation; A1C = A measure of the percent of blood glucose attached to a hemoglobin molecule and an indicator of the past 3-month lifestyle and self-management control; BMI = Body Mass Index, a person's weight divided by their height; BPsys = Blood Pressure systolic; BPdia = Blood Pressure diastolic.

The APOD intervention group ended the 3-year study with reduced A1C (-1.1%) and BMI (-2.59) mean values. Blood pressure comparative differences were negligible.

The A1C and BMI effect sizes, as measured by *d,* were 0.51 and 0.39 respectively (Appendix H). By convention, an effect size measured at .2, .5, and .8, regardless of sign, is considered small, medium, or large (Cohen, 1988/2011). By this measure, the size of the intervention effect on A1C was medium and for BMI, somewhat small (pp. 285-287).

A case group (APOD) study was performed using *t* test and Cohen's effect size methods. Six-month pretest-posttest (Appendix I) PAM scores, activation levels, and attendant data A1C, BMI, and BP) results are shown in Table 5.

Table 5

APOD, PAM Score Comparisons by Level and Clinical Outcome (6-months)

Group	***N***	**PAM Score**	**PAM Level**	**A1C**	**BMI**	**BPsys**	**BPdia**
APOD pre	30	49.6	1.87	6.9%	31.42	125.4	85.93
APOD post	30	62.0	2.73	6.6%	29.58	122.9	81.97
Difference /*SD*	0	12.4/9.67	.86/.94	-.3/.44	-1.84/2.93	-2.5/14.5	-4.0/12.3

Note. SD = Standard Deviation; A1C = A measure of the percent of blood glucose attached to a hemoglobin molecule and an indicator of the past 3-month lifestyle and self-management control; BMI = Body Mass Index, a person's weight divided by their height; BPsys = Blood Pressure systolic; BPdia = Blood Pressure diastolic

PAM scores and activation levels, as well as A1C and BMI results, improved within the APOD intervention group at 6 months. Differences in systolic (BPsys) and diastolic (BPdia) blood pressure values were negligible.

Mean PAM Scores and PAM Level differences were 12.4 and 0.86 respectively (Appendix J). When measured by Cohens *d* method, PAM scores by standard deviation (12.4/9.67) were found to have increased by a large magnitude of $d = 1.28$, and the active PAM level of change (.86/.94) was also large at $d = 0.87$. The APOD intervention cases

ended the 6-month study with lowered A1C (-.30%), and BMI (-1.84) mean values. A1C and BMI effect sizes, as measured by Cohen's *d* method were medium, at (-.3/.44 = 0.68) and (-1.84/2.93 = 0.63) respectively (Cohen, 1988).

Research Questions and Hypotheses Inferences

The three hypotheses were tested in accordance with the inferential testing procedures described in Chapter 3. All testing was two-tailed and conducted at the .05 level of significance. Recall that patient activation can change in either direction. A series of tests corollary to the principal hypothesis were also carried out to further explore the effect of the APOD complementary network. Hypothesis testing and *t* tests were conducted for 3-year case-control independent samples and 6-month case-group related samples. The research analysis was conducted in four steps:

1. State the hypothesis: null = no effect; research/alternative = an effect.
2. Set the decision criteria: 95% confidence and acceptance/rejection p value < .05.
3. Compile/sample data and run statistics.
4. Conclude.

Hypothesis testing was conducted with a *t* test statistic and investigated further with Cohen's *d* effect size determination.

For the 3-year case-control analysis, the independent categorical variable was participant group (APOD or UIHO), and the dependent variables were A1C, BMI, and BP clinical outcomes. The central research question was "Did the complemented APOD study group manage their (A1C) blood glucose trend better than the nonparticipating UIHO control group. An affiliated research question was "Did the complemented APOD

study group manage their BMI and BP better than the nonparticipating UIHO control group"? The third research question considered whether the APOD case group's PAM scores and attendant data (A1C, BMI, and BP) improved. The theory is that the complemented APOD case group, having taken part in the PAM motivational interviewing and diabetes self-management education, would show greater improvement than the comparison UIHO control group. Hypothesis testing is shown, as follows:

Hypothesis 1: Comparison between Groups by A1C

The first hypothesis was constructed to answer the primary research question: What is the effect complementary APOD had on the A1C levels of patients with diabetes? The hypothesis tested was

> $H_0$1: There is no difference in diabetes self-management trends (A1C) between case and control groups.

Pooled variance *t* tests for independent groups and effect size measurements tested this hypothesis.

The (APOD) intervention group ended the 3-year study with a moderately reduced A1C mean value (M = 6.9, SD = 2.13) compared to the control group (M = 8, SD = 2.10). The *t* tests were statistically significant, t (135) = .632, p = .004; thus the null hypothesis was rejected. Group mean differences by A1C standard deviation (-1.1/2.17) found a medium (d = 0.51) intervention effect size, which is comparable to similar case-control studies. The results produced from the tests of the two remaining hypotheses of the study, with a particular focus on the intervention group, are shown next.

Hypothesis 2: Comparison between Groups by BMI and BP

The second hypothesis stated in Chapter 1 was modified to reflect a case-control comparison.

*H*2: There is no difference in clinical outcomes (BMI and BP) between case and control groups.

T tests and effect size measurements were performed to test the hypothesis.

Substantial weight loss, as measured by the BMI, was achieved by the APOD intervention group. The intervention group ended the study with a lower BMI (M = 32.1, SD = 4.01) compared to the control group (M = 34.7, SD = 7.50. Thus this difference was significant, t (135) = .008, p = .03. Comparison between groups for mean weight loss by BMI found a small (d = 0.39) intervention effect size. Case-control study found the diabetes intervention effect negligible for BPsys and BPdia (d = .11 and .003).

Hypothesis 3: Pre- and Post- PAM Comparison within the Case Group

Continuous intervention group participation during the concluding 6 months of this 3-year study provided an opportunity to explore the third research question: What is the effect of PAM activated APOD case group on clinical outcomes? To explore this question, the hypothesis tested was

*H*3: There is no case group (APOD) pre- and post- differences in PAM and attendant data (A1C, BMI, and BP) at 6 months beyond intervention.

Pooled variance *t* test for related groups and effect size measurements were performed to test this hypothesis.

The PAM instrument ranked participant activation levels in relation to the three attendant outcome variables (A1C, BMI, and BP). APOD case group study also determined improved 6-month pretest-posttest PAM levels and large A1C and BMI increases. Blood pressure differences were negligible. Participants who actively participated in APOD experienced PAM score (M = 12.4, SD = 9.67) and level (M= *0.86*, SD= *.94*) improvement. This pre- and posttest difference in terms of patient activation change was significant, t (30) = -7.058, $p < .001$, d = 1.29, supporting rejection of the null hypothesis. The PAM level metric was seen to improve, going from level 2 (building knowledge and confidence) to a rather confident, self-care level 3 (taking action). There were also positive changes in A1C (M = -0.3, SD = 0.44) and BMI (M= -1.84, SD= 2.93) at 6 months beyond intervention. Weight loss was substantial and strongly reflected BMI t test and effect size magnitudes. These results suggest a strong relationship among the APOD intervention, PAM activation scores, and clinical outcomes (A1C and BMI). The results reflected large effect- size magnitudes.

Summary

This quasi-experimental case-control trial was conducted primarily to examine the effect of diabetes patient empowerment, activation, and community-based support with respect to improved blood sugar, weight loss, and blood pressure outcomes. Additional factors known to influence lifestyle and activation improvement were explored within the APOD community-based support group. The number of participants was 135, with 48 cases and 87 controls. The PAM instrument ranked participants' change propensity along

a Likert-type scale. Case study was performed to analyze 3-year, as well as 6-month pretest-posttest PAM scores and attendant data of A1C, BMI, and BP.

The controls UIHO data used to test the hypotheses were from a sample that is dispersed throughout 30 UIHO special diabetes programs. Key outcome indicators for the control group were extrapolated to the year 2014 so contemporaneous study periods could be compared. Comparison between groups by diabetes trend (A1C) showed a statistically significant, medium intervention effect size that is comparable to similar cultural and ethnic minority studies. The 3-year case-control study found the diabetes intervention statistically significant, yet small for BMI and negligible for BP. Case group study determined significantly improved 6-month pretest- posttest PAM scores and large A1C and BMI effect sizes. Chapter 5 includes the interpretation of the results in the context of the theoretical self-management model and recommendations for further study.

Chapter 5: Discussion, Conclusions, and Recommendations

Overview

The purpose of this research was to measure the extent to which marketplace clinics and community-based diabetes support groups' activated self-care, behavioral modification, and health outcomes. My participatory, advocacy research was aimed at promoting complementary and integrative health improvement for Minneapolis medically underserved and urban Indian persons with diabetes. For the past several decades, this population's diabetes disparity rates have been high, and the usual care clinics had not moved the metrics. Minneapolis has preeminent health care resources, and many things have been tried. Ricci-Cabello et al. (2014) concluded that peer-to-peer, community-based settings have the most success, particularly with racial and ethnic minority groups. In this case control assessment, I found that the marketplace-complemented intervention group managed their diabetes trend (A1C) and weight loss (BMI) more effectively than the federally supported (UIHO) group. The positive effects of marketplace clinic complementation, community-based support, and activation demonstrated substantial blood sugar control, weight loss, and healthful lifestyle improvement.

Interpretation of the Findings

A central theme emerging from the literature review was that community health promotion, self-management education, and activation can have positive and beneficial effects for all-including urban Indian persons with diabetes. Bandura's (2012) social learning, Halvorson's (2009) universal health care access, and Albee's (2012) diabetes community empowerment theories provided my study's theoretical foundation. Such

empowering and activating theory, as well as Hibbard et al.'s (2004) PAM and Remmers et al.'s (2009) publications were reviewed to inform this study's construction.

In the quantitative research methodology, I tested whether the community-based diabetes support group (APOD) performed significantly better (or worse) than the UIHO control group with respect to blood glucose management and related diabetes health measures. A standard survey instrument, PAM, was employed to measure the pre and post intervention effect (Hibbard & Cunningham, 2008).

The central research question addressed the following: Could Minneapolis marketplace clinics broaden their business plans and complement diabetes care for vulnerable communities including urban residing American Indians? Hypothesis testing was broken down into two parts. For the first subquestion, I tested the extent to which the diabetes clinical measures (A1C, BMI, and BP) improved more for the marketplace-complemented, community-based group than for the usual care group. For the Subquestion 2, I queried the following: To what extent did the PAM scores and attendant (A1C, BMI, and BP) outcome measures increase substantially more for the community-based study group?

In both queries, the alternative hypothesis was supported by the findings. Comparison between groups by diabetes trend (A1C) found a medium-sized intervention effect and a somewhat smaller BMI improvement. I found improved pretest-posttest PAM scores and a large A1C reduction effect size. The community-based self-management advantages were affirmed, and new insights revealed the positive effect a community-based self-management intervention had on patient activation levels of

individuals with diabetes. The findings were consistent with other cultural and ethnic PAM studies and offered information for other researchers who may be interested in patient activation applications. Greene and Hibbard (2012) also found that patient activation was an effective intervention. This study's information regarding Minneapolis racial and cultural minority persons may extend the Greene and Hibbard scope.

Limitations

This study has several strengths and limitations to be considered when interpreting the results. Important strengths were APOD's dedication and willingness to share diabetes clinical and behavior information. The marketplace engagement and financial support provided APOD start-up resources (Albee, 2011). For the past 4 years, this community-based support group led by example to build a complementary network for this cross-cultural community. The marketplace clinics continued outreach, and APODs commitment facilitated an ability to conduct a sizable (N = 135) and lengthy (3-year) case-control comparative evaluation.

According to Shadish, Cook, and Campbell (2002), threats to validity, including lack of control group matching, can be mitigated by using a quasi-experimental study design, and researchers can develop inference for generalized populations if the study sample size is sufficiently large to justify the use of parametric statistical tests. Despite some non-normality of the data, the comparative (A1C, BMI, and BP) data were accessible via data agreement (for cases, n = 48) or as published information (controls, n = 87). Another important strength of this study was the standard PAM scale used for measuring the APOD case group activation with respect to attendant data (A1C, BMI,

and BP). The PAM reliably reported motivational results in the community-based setting of this study.

The study results may not be applicable to other populations and settings. Face-to-face meetups may not be for everyone; for sponsoring cross-cultural interests and sustaining self-efficacy in changing societies (e.g., Bandura, 2009), observational learning principles could constrain complementary knowledge sharing. In addition, the Minneapolis UIHO site-specific diabetes data were not available. The controls dataset was derived from the UIHI Diabetes Care and Outcomes Summary Report (2014, p. 5). Also, UIHO diabetes program descriptive information was obtained from Indian Health Service Special Diabetes Program for Indians, 2011 Report to Congress (2012, p. 35). The Minneapolis site is one of 30 IHS special diabetes programs. The UIHOs summary report described an annual average 2,600 diabetes patients chart audits (or 87 charts per site) for a 3-year period (through 2013). Without case-control proximal matching, causal inference is limited. This study's findings are not necessarily generalizable for other urban Indian health organizations. However, I found positive and beneficial effects of this marketplace clinic and community-based support intervention for medically underserved areas and the urban Indian population.

Recommendations

After reviewing this study's strengths and limitations, the results have genuine applicability. The observed improvement in patient activation provides a basis for community health promotion and innovation (Christensen, 2009) that engages with existing market alliances rather than creating more bureaucracy. Marketplace clinics, in

conjunction with community-based activation, demonstrated potential to be a part of a broader community-based, self-management program. APOD participants were found to be more informed patients, resulting in more productive and satisfying patient-provider encounters. Longer term, the positive association found between patient activation and self-management behaviors indicates that investment in complementary networks can be expected to generate gains in diabetes health outcomes.

The recommended next steps for activating self-help, eliciting behavioral change, and improving diabetes outcomes involve community health promotion. A complementary network of marketplace clinics and community-based support needs stakeholder commitment. As described in Chapter 1, the CVS marketplace clinic was pulled out of the Minneapolis inner-city. The Allina/CVS strategic partnership is attempting to fill the void by instituting a program referred to as the Backyard Initiative (Community at the Core: Backyard Initiative Assessment Report, 2014). This research project evaluated the extent to which marketplace clinics extended their business model to be more culturally aware and inclusive of medically underserved and urban Indian persons with diabetes.

This is the first study to research marketplace clinics capacity to broaden health care access, activate community-based diabetes partnerships, and complement urban Indian health care. Complementary consumer empowerment, patient activation, and community-based diabetes education have the prospect of improving diabetes health outcomes for all - including Minneapolis urban Indians. Research findings could provide

guidance for integrating diabetes self-management services for Minneapolis and the United States' 30 urban Indian diabetic programs.

Implications for Social Change

Consistent with ACA Section 2717 policy directives, the APOD support group has met evidence-based requirements and has demonstrated diabetes health outcomes improvement. The Native American Community Clinic and the Indian Health Board of Minneapolis (UIHOs) belong to the Federal Urban Health Network. Based upon the developing working relationships with the board and staff levels, I believe there is potential for advancing the complementary network for the medically underserved South Minneapolis population, including urban Indian persons with diabetes.

The positive social change implications drawn from this study are twofold. First, the marketplace and community-based complementary network offers resources, increased access to quality care, and an opportunity to help reduce diabetes health disparity. The second social change opportunity comes as marketplace resources are matched with IHS resources and steps are taken to share more equitably these pooled resources with the urban Indian two-thirds majority of the United States 4.1 million American Indian population.

Conclusions

The aim of this study was to explore the intervention effect of a collaborating marketplace and community-based support group on patient activation and diabetes health outcomes. The sample for this two-group quasi-experimental design consisted of

Minneapolis medically underserved and urban adults who were diagnosed with diabetes. During this 3-year study, the APOD intervention group achieved better health outcomes.

Study data were analyzed to explore three research questions. The principal research question was: What is the effect of the effect of using a community-based self-management on diabetes health outcomes (A1C, BMI, and BP)? The results revealed that a community-based self-management designed for use by diabetic participants significantly improved diabetes trend (A1C) and weight loss (BMI). The second research question involved the patient activation levels of diabetic patients from a medically underserved and urban Indian community? Within the intervention group, participants engaged at the second stage of patient activation demonstrated significant improvement in their patient activation scores. My research analysis found a strong association between use of a community-based self-management and change in patient activation. A self-management system model grounded in self-care and self-management theories were aligned with the study results.

The current study is the first time that the PAM was applied as a community-based self-management intervention in a cross-cultural setting. In this trial, a positive effect was found which demonstrated that a community-based self-management intervention can improve levels of activation and attendant diabetes outcomes (A1C and BMI). This marketplace and community-based intervention may be expected to establish precedence for future applications. This study may serve as a model for quantifying the value of the community-based self-management intervention in terms enabling linkage to improvement in the quality and efficiency of chronic care management.

Positive social change includes diabetes health improvement and research study replication within the medically underserved and urban Indian populations. Although many studies (Welty et al., 1995; Egan et al., 2009) describe the United States Native American population health disparity; there are very few research projects, such as (Anderson, 2007) which address urban Indian health care and advance research applications which are specific to urban Indian health care improvement.

My literature review over the past 1-year, found hundreds of articles confirming that the urban Indian sub-population lacks primary health care and is particularly at risk of increased diabetes incidence without expanded health access. However, very few evidence-based research articles, such as Rosenbaum, Finnegan, and Shin (2009), discuss matters of critical concern for the urban Indian community. That is, whether limited access to affordable health care deprives the underserved urban Indian population of fully integrated health service during this period of health reform and recession. The significance of this research project is that it accepts the urban Indian health disparity challenge and commits action research toward urban Indian health improvement.

Throughout this study, Deming (1998) quality principles were held in high esteem. Research questions were reframed to reflect upon the marketplace' social responsibility. The quality of care criteria was benchmarked to see whether reciprocating marketplace clinics meaningfully contributed to the APOD diabetes support group. During the four years course of this study, approximately $50,000 per year financial support was provided. Observable management interaction saw many instances where marketplace clinics:

- Refined their cost/quality strategy to include the quality-of-cultural-awareness.
- Engaged with and reached out to medically underserved and urban Indian persons with diabetes.
- Complemented APOD community-based diabetes support.

Actuating the Deming "quality is job one" philosophy and implementing an effective complementary network, requires extraordinary public/private leadership, dedication, and long-term commitment.

Many health professionals were and are still inspired by the Humphrey (1964) led War on Poverty. Much of the human capital donated to this research project convinces this researcher that the consensus continues, as we work together to help deliver needed health services and socially just responses for the most vulnerable. Much of the universal access, complementary, and self-managed diabetes care aspects of this research may be seen to align with health reform initiatives (ACA Section 2717). According to Halvorson (2009), we can do the right thing and "get the right care" inclusive of racial and cultural minority populations (p. 41). With this challenging goal in mind, my research analysis evaluated the extent marketplace clinics integrated quality care activities with APOD.

An evaluation of community-based and urban Indian diabetes programs allowed researchers evidence-based comparison and understanding. The positive effects of marketplace clinics and APOD complementation were borne out with respect to improved blood sugar control, weight loss, and healthful lifestyle adaptation. Translating these insights into useful applications can diminish access barriers and help move the health disparity metric. This study demonstrated the large scale emergence of a

complementary network of people with diabetes, taking charge and managing their health and health care. To turn this social change potential into reality, collaborating health services marketplace management and policy thought leaders can build on this study's discoveries and advance adoption for their customers, including the medically underserved and urban Indian population.

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Appendix A – Diabetes Awareness and Community Health Promotion Materials

Got Diabetes?

We do too!

Several education and support groups are in our community that can help all of us avoid being victims of diabetes.

Check out any of the following:

Health & Wellness Program
Minneapolis American Indian Center
1530 East Franklin Avenue
Minneapolis, MN 55404
Call April Smith • 612-879-1770
www.maionet.org

Indian Health Board of Minneapolis
Diabetes Program
1315 East 24th Street
Minneapolis, MN 55404
Call Lois Brown • 612-721-9863
www.indianhealthboard.com

Diabetes Prevention & Support Group
Native American Community Clinic
1213 East Franklin Avenue
Minneapolis, MN 55404
Call Brian Joyce • 612-87208086 Ex 1041
www.naoo-healthoare.org

A Partnership Of Diabetics - A-POD
Phillips Community Center
2323 Eleventh Avenue South
Minneapolis, MN 55404
Call Robert Albee • 612-812-2429
ralbee4045@aol.com

FFI: Contact Bob Rick at www.nahmaoare.com

Appendix B - Insignia Health, Patient Activation Measure (PAM) License

Dear Dr. Hibbard,

I am a Walden University doctoral student and have studied your Patient Activation Measure (PAM) research development with great interest. Particularly appreciated are your co-authored Remmers et al. (2009) article as well as the Greene and Hibbard (2012) publication, which found that patient activation was an effective intervention and recommended that future studies include Minneapolis racial and cultural minority persons.

My project involves Minneapolis Native American diabetes prevention and Dr. Robert Hoye is my committee chair. The proposed dissertation title is: Marketplace clinics complementing community-partnered diabetes care for urban residing American Indians. With your kind permission, I would like to use the PAM assessment tool in my research. Hopefully, study results will contribute to health disparity knowledge and advance positive social change.

Sincerely,
Robert Rick

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Robert, You will need a license to use the PAM and you can get one online.
http://insigniahealthstore.com
You can use the doctoral student license.

Best,
Judith Hibbard
Subject: Order 894 from catalog yhst-133902280944007
Date Mon Nov 3 12:53:42 CST 2014
Bill to Same
E-Mail to robert.rick@waldenu.edu

Appendix C - Patient Activation Measure (PAM) 13-item Survey Instrument

Insignia Health

Below are some statements that people sometimes make when they talk about their health. Please indicate how much you agree or disagree with each statement as it applies to you personally by circling your answer. Your answers should be what is true for you and not just what you think others want you to say.

If the statement does not apply to you, circle N/A.

1. When all is said and done, I am the person who is responsible for taking care of my health	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
2. Taking an active role in my own health care is the most important thing that affects my health	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
3. I am confident I can help prevent or reduce problems associated with my health	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
4. I know what each of my prescribed medications do	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
5. I am confident that I can tell whether I need to go to the doctor or whether I can take care of a health problem myself	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
6. I am confident that I can tell a doctor concerns I have even when he or she does not ask	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
7. I am confident that I can follow through on medical treatments I may need to do at home	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
8. I understand my health problems and what causes them	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
9. I know what treatments are available for my health problems	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
10. I have been able to maintain (keep up with) lifestyle changes, like eating right or exercising	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
11. I know how to prevent problems with my health	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
12. I am confident I can figure out solutions when new problems arise with my health	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
13. I am confident that I can maintain lifestyle changes, like eating right and exercising, even during times of stress	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A

3

Appendix D – A Partnership of Diabetics Data Use Agreement

DATA USE AGREEMENT

This Data Use Agreement ("Agreement"), effective as of 07Dec2014 ("Effective Date"), is entered into by and between Robert Rick ("Data Recipient") and A Partnership Of Diabetics (A-POD) as ("Data Provider"). The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set ("LDS") for use in research **in accord with laws and regulations of the governing bodies associated with the Data Provider, Data Recipient, and Data Recipient's educational program.** In the case of a discrepancy among laws, the agreement shall follow whichever law is more strict.

1. Definitions. Due to the study's affiliation with Laureate, a USA-based company, unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the USA "HIPAA Regulations" and/or "FERPA Regulations" codified in the United States Code of Federal Regulations, as amended from time to time.

2. Preparation of the LDS. Data Provider shall prepare and furnish to Data Recipient a LDS in accord with informed consent and any applicable laws and regulations of the governing bodies associated with the Data Provider, Data Recipient, and Data Recipient's educational program.

   Data Fields in the LDS. **No direct identifiers such as names may be included in the Limited Data Set (LDS).** In preparing the LDS, Data Provider shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research: The data-points that partner site will be providing are:

   1) Participant responses to Patient Activation Measure (PAM) 13™ Licensed Materials © from Insignia Health, LLC 2013 and

   2) De-identified A-POD attendance data with corresponding A1C, Blood Pressure, and Weight clinical information.

3. Responsibilities of Data Recipient. Data Recipient agrees to:

   a. Use or disclose the LDS only as permitted by this Agreement or as required by law;

   b. Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

   c. Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

   d. Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement; and

e. Not use the information in the LDS to identify or contact the individuals who are data subjects.

4. Permitted Uses and Disclosures of the LDS. Data Recipient may use and/or disclose the LDS **for its Research activities only.**

5. Term and Termination.

   a. Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.

   b. Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.

   c. Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.

   d. For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.

   e. Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.

6. Miscellaneous.

   a. Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.

   b. Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.

   c. No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.

e. Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

DATA PROVIDER

Signed: [signature]

Print Name: Robert Albee

Print Title: CEO A-POD

DATA RECIPIENT

Signed: [signature]

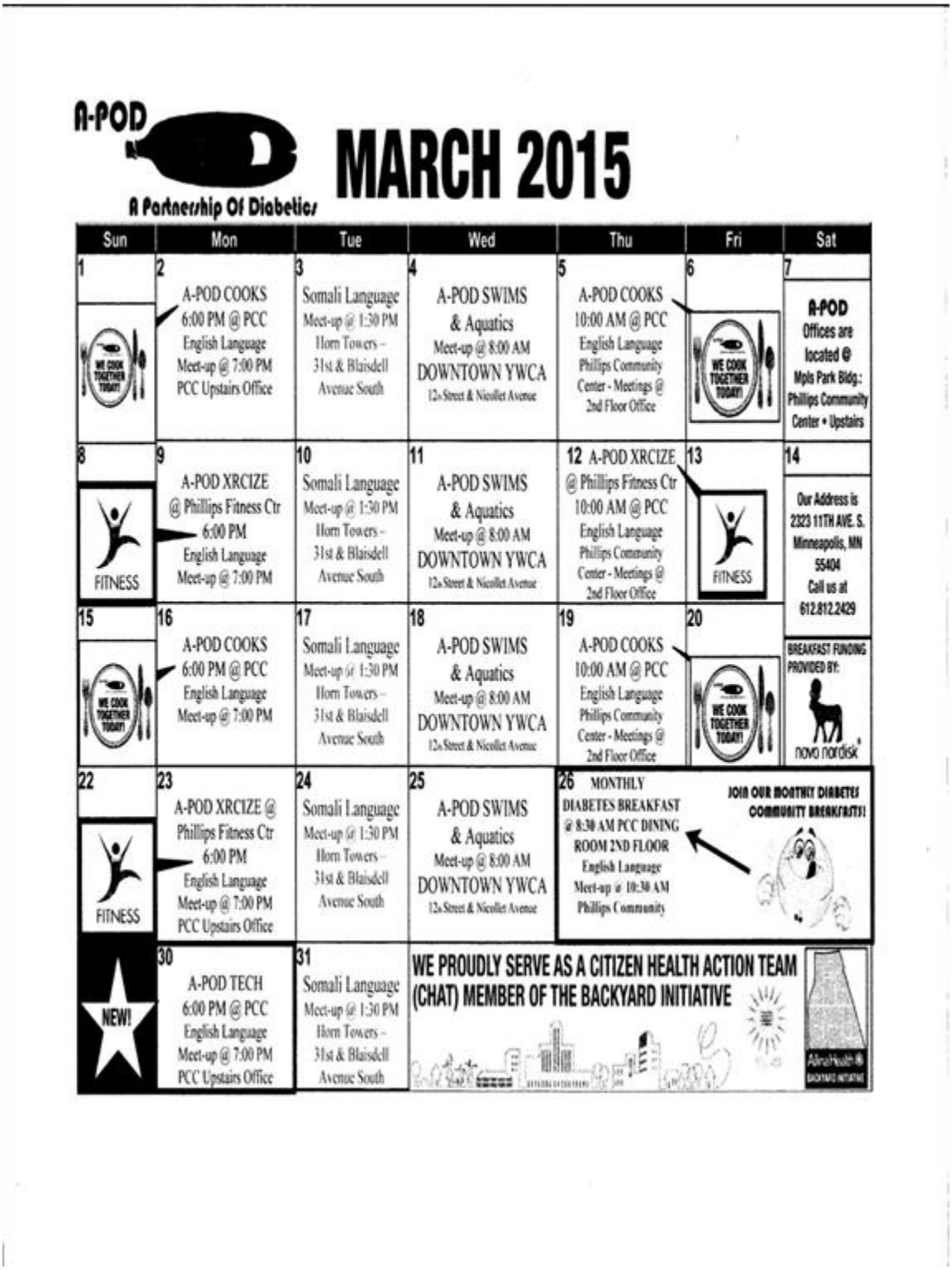
Print Name: Robert Rick

Print Title: Walden U student PhD.

Only those A-POD participants who sign an agreement authorizing A Partnership Of Diabetics co-founders to submit their data sets will be included in this agreement. Each participant must provide four separate authorization agreement copies: One to Robert Rick, data recipient; one to keep for themselves; one in the same file where their information is kept and one to Robert & Sharon Albee, A-POD's co-founders. The Data Recipient will only receive data that has all identifiers eliminated. The Data Recipient shall pay co-founders $25 per hour for any work associated with preparing and providing this data in a format that conforms to the LDS mentioned above.

PJR

Appendix E - A Partnership of Diabetics (APOD) Monthly Calendar



Appendix F - Expected PAM Effect Size

The sample size shown in Chapter 3 was based on a medium effect size $d = 0.65$ of the average PAM intervention effect on four A1C and one BMI related articles:

1. Greene and Hibbard (2012) described the probability that chronic care including diabetes outcome variables were significantly related to patient activation, with a medium effect (A1C $d = 0.62$) and somewhat small effect for (BMI $d = 0.38$).
2. Lorig et al. (2010) described an online diabetes prevention trial, which included a Native American sample, as having a medium effect on reducing A1C. Treatment participants, when compared with usual-care control subjects, had significantly lower A1C ($P < 0.05$) at - 0.614 % with a medium effect size $d = 0.499$).
3. Remmers et al. (2009) examined the relationship between PAM and diabetes-related health outcomes using multivariate logistic regression and found that activation was predictive for A1C percentage in good control (≤8%) 70.6 63.9 <.01) with an odds ratio of 1.018 (1.004–1.033) .01 odds ratio, indicating a medium effect size $d > 0.56$.
4. Solomon, Wagner, and Goes (2012) demonstrated a positive and significant effect on the patient activation levels of participants in the intervention group. A significant difference in posttest patient activation scores was found between the two groups ($F_{1,123} = 4.438$, $P = .04$, $r^2 = 0.196$) and a large effect size $d > 0.80$.
5. Stombaugh (2010) reported a large 16.7% association between program participation and weight change, with large being defined as greater than ($r^2 = 0.14$) or an effect size $d > 0.80$.

Appendix G - Case-Control Dataset

GROUP	PID	A1C	BMI	BpSys	BpDia
1	30001	7.0	31.20	110	64
1	30002	6.4	34.01	127	76
1	30003	6.2	30.42	135	72
1	30004	5.9	30.74	150	92
1	30005	5.5	34.72	108	68
1	30006	10.4	32.26	135	82
1	30007	6.0	42.22	116	74
1	30008	5.9	29.95	154	105
1	30009	5.7	27.67	124	76
1	30010	7.0	34.82	161	94
1	30011	7.4	34.36	118	82
1	30012	5.3	31.86	139	88
1	30013	5.2	39.12	131	71
1	30014	5.7	36.57	125	70
1	30015	6.0	27.53	127	78
1	30016	6.4	37.58	135	88
1	30017	7.1	28.32	102	73
1	30018	6.1	32.59	134	80
1	30019	6.7	26.72	120	64
1	30020	5.4	29.37	111	91
1	30021	8.8	27.12	148	98
1	30022	9.0	30.07	122	73
1	30023	5.3	29.18	119	84
1	30024	6.0	29.62	121	76
1	30025	5.5	26.25	132	78
1	30026	5.8	35.77	143	88
1	30027	5.9	35.42	122	73
1	30028	6.1	30.62	135	99
1	30029	5.5	22.21	121	80
1	30030	6.9	30.13	118	71
1	30031	6.2	36.72	132	77
1	30032	16.4	35.42	122	99
1	30033	5.8	39.30	88	74
1	30034	5.8	32.77	123	84
1	30035	6.1	27.61	120	64
1	30036	8.1	32.49	117	86

1	30037	7.6	36.18	118	71
1	30038	8.1	37.43	124	76
1	30039	6.0	33.64	121	77
1	30040	6.1	32.11	126	74
1	30041	12.2	30.41	132	78
1	30042	5.6	31.42	147	88
1	30043	6.4	28.19	127	82
1	30044	12.3	29.12	132	97
1	30045	5.6	35.71	141	63
1	30046	5.5	34.38	117	79
1	30047	6.5	26.85	132	77
1	30048	8.8	32.08	134	88
2	30049	4.5	36.57	125	70
2	30050	4.5	40.56	141	94
2	30051	5	36.90	140	82
2	30052	5.5	29.70	120	94
2	30053	5.5	55.40	134	88
2	30054	6	36.57	125	70
2	30055	6	39.14	132	68
2	30056	6	39.14	132	68
2	30057	6	42.05	122	88
2	30058	6.5	30.74	111	91
2	30059	6.5	29.18	119	84
2	30060	6.5	29.18	119	68
2	30061	6.5	22.21	121	80
2	30062	6.5	29.62	121	96
2	30063	6.5	58.98	128	71
2	30064	6.5	30.41	132	78
2	30065	6.5	30.41	132	78
2	30066	6.5	23.11	148	90
2	30067	6.5	29.62	142	98
2	30068	6.5	40.74	115	88
2	30069	6.5	22.21	126	90
2	30070	7	30.74	111	91
2	30071	7	23.11	118	98
2	30072	7	27.44	142	99
2	30073	7	35.39	144	94
2	30074	7	35.39	130	107
2	30075	7	41.88	120	78
2	30076	7	39.30	118	70

2	30077	7	29.70	120	84
2	30078	7	29.70	120	81
2	30079	7	33.64	121	77
2	30080	7	33.64	121	77
2	30081	7	58.98	128	71
2	30082	7	27.44	132	76
2	30083	7	27.44	132	76
2	30084	7	30.42	135	72
2	30085	7	30.42	135	72
2	30086	7	27.44	144	98
2	30087	7	35.35	122	82
2	30088	7	35.35	144	94
2	30089	7.5	38.40	142	91
2	30090	7.5	38.40	122	80
2	30091	7.5	36.49	122	73
2	30092	7.5	36.49	122	73
2	30093	7.5	35.29	124	68
2	30094	7.5	30.74	124	68
2	30095	7.5	37.43	124	70
2	30096	7.5	37.43	124	70
2	30097	7.5	37.13	127	68
2	30098	7.5	39.14	132	77
2	30099	7.5	30.62	135	88
2	30100	7.5	40.56	133	88
2	30101	7.5	34.01	148	112
2	30102	8	30.71	124	76
2	30103	8	30.71	124	76
2	30104	8	37.13	127	68
2	30105	8	31.86	135	80
2	30106	8	44.72	130	88
2	30107	8.5	53.85	140	90
2	30108	8.5	55.59	140	90
2	30109	8.5	37.43	124	68
2	30110	8.5	37.43	124	68
2	30111	8.5	32.59	134	72
2	30112	8.5	34.38	115	68
2	30113	8.5	34.38	118	68
2	30114	9	29.95	105	70
2	30115	9	29.95	105	70
2	30116	9	29.62	121	98

2	30117	9	36.49	122	73
2	30118	9	36.49	122	73
2	30119	9	53.85	122	66
2	30120	9	29.62	112	60
2	30121	9	28.66	128	98
2	30122	10	32.49	117	86
2	30123	10	35.39	135	82
2	30124	10	35.39	135	82
2	30125	10	31.86	120	88
2	30126	11	32.49	148	110
2	30127	11	21.18	131	71
2	30128	11	21.18	131	71
2	30129	12	39.53	135	84
2	30130	12	30.62	135	84
2	30131	13	35.39	120	70
2	30132	13	35.39	118	68
2	30133	14	32.59	134	72
2	30134	15	30.41	123	69
2	30135	15	30.71	124	76

Appendix H - Case-Control T-Test (3-Year)

```
GET DATA /TYPE=XLSX /FILE='C: \Users\Bob\Desktop\TTest135.xlsx'
MEANS TABLES=A1C BMI BpSys BpDia BY GRP
T-TEST GROUPS=GRP (1 2) / VARIABLES = A1C BMI BpSys BpDia / CRITERIA=CI (.95).
```

Means

	GRP	N	Mean	Std. Deviation	Std. Error Mean
A1C	1.0	48	6.900	2.1327	.3078
	2.0	87	8.000	2.1020	.2254
BMI	1.0	48	32.0885	4.01649	.57973
	2.0	87	34.6824	7.64421	.81955
BpSys	1.0	48	127.000	13.3257	1.9234
	2.0	87	127.345	9.5270	1.0214
BpDia	1.0	48	80.042	10.0931	1.4568
	2.0	87	80.345	11.3771	1.2198

T-Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
A1C	Equal variances assumed	.230	.632	-2.895	133
	Equal variances not assumed			-2.883	95.837
BMI	Equal variances assumed	7.391	.007	-2.188	133
	Equal variances not assumed			-2.584	132.770
BpSys	Equal variances assumed	3.468	.065	-.174	133
	Equal variances not assumed			-.158	74.028
BpDia	Equal variances assumed	1.913	.169	-.154	133
	Equal variances not assumed			-.160	107.202

Independent Samples Test

		t-test for Equality of Means			
		Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
					Lower
A1C	Equal variances assumed	.004	-1.1000	.3799	-1.8514
	Equal variances not assumed	.005	-1.1000	.3815	-1.8573
BMI	Equal variances assumed	.030	-2.59387	1.18565	-4.93905
	Equal variances not assumed	.011	-2.59387	1.00386	-4.57951
BpSys	Equal variances assumed	.862	-.3448	1.9814	-4.2639
	Equal variances not assumed	.875	-.3448	2.1778	-4.6841
BpDia	Equal variances assumed	.878	-.3032	1.9671	-4.1940
	Equal variances not assumed	.874	-.3032	1.9000	-4.0697

Appendix I - Pre and Post APOD Dataset

PRE	PID1	Score1	Level1	A1C1	BMI1	Bpsys1	Bpdia1	POST	PID2	Score2	Level2	A1C2	BMI2	BPsys2	BPdia2
1	11111	36.8	1	7.3	34.98	129	92	2	21111	43.7	1	7.0	30.11	117	86
1	11112	40.7	1	6.8	30.20	102	73	2	21112	60.6	3	6.4	29.10	88	74
1	11113	33.0	1	6.1	31.25	118	83	2	21113	51.0	2	5.5	31.00	117	82
1	11114	36.8	1	7.9	36.68	111	91	2	21114	51.0	2	7.6	34.78	147	112
1	11115	45.3	1	8.3	33.40	137	98	2	21115	60.6	3	7.1	28.11	118	71
1	11116	58.1	3	10.4	35.55	122	89	2	21116	70.2	3	9.7	28.64	115	86
1	11117	51.0	2	8.4	34.20	134	80	2	21117	60.6	3	8.4	28.98	123	84
1	11118	36.8	1	6.4	26.78	120	64	2	21118	60.6	3	6.4	26.61	120	64
1	11119	33.0	1	6.0	27.22	122	89	2	21119	58.1	3	5.9	28.80	115	86
1	11120	58.1	3	6.3	29.37	111	91	2	21120	70.2	3	6.2	26.52	147	112
1	11121	58.1	2	6.3	31.10	148	98	2	21121	68.8	3	6.2	26.18	118	71
1	11122	33.0	1	6.0	35.78	139	99	2	21122	51.0	2	6.0	30.10	115	86
1	11123	60.6	3	6.0	34.55	134	95	2	21123	51.0	2	5.8	32.95	128	93
1	11124	67.8	3	9.1	34.20	128	92	2	21124	77.7	4	7.6	32.21	117	86
1	11125	60.6	3	8.2	35.56	122	73	2	21125	67.8	3	8.0	31.11	124	76
1	11126	36.8	1	7.3	28.45	119	84	2	21126	60.6	3	7.3	29.10	121	77
1	11127	45.3	1	7.2	32.80	128	92	2	21127	70.2	3	6.7	29.40	117	86
1	11128	60.6	3	6.6	33.12	102	73	2	21128	70.2	3	6.2	29.30	88	74
1	11129	67.8	3	8.3	36.25	132	78	2	21129	70.2	3	7.1	34.24	128	80
1	15781	36.8	1	6.5	28.11	124	92	2	25781	60.6	3	6.4	28.39	117	86
1	11130	60.6	3	6.8	27.10	134	80	2	21130	67.8	3	6.8	29.90	123	84
1	11131	70.2	3	6.1	29.89	120	64	2	21131	60.6	3	6.1	27.61	120	64
1	11132	43.7	1	6.6	32.08	143	88	2	21132	60.6	3	6.5	31.42	147	88
1	11133	40.7	1	5.7	26.90	135	99	2	21133	70.2	3	6.4	33.34	132	97
1	11134	40.7	1	6.4	33.04	133	95	2	21134	60.6	3	6.1	33.34	129	71
1	11135	40.7	1	6.0	24.50	121	76	2	21135	51.0	2	5.9	23.25	126	74
1	11136	70.2	3	5.8	22.21	121	80	2	21136	70.2	3	5.8	24.58	141	63
1	11137	70.2	3	6.9	32.13	118	71	2	21137	70.2	3	6.2	30.13	117	79
1	11138	33.0	1	6.0	28.19	132	77	2	21138	45.3	1	6.1	26.21	138	79
1	11139	60.6	3	6.1	36.89	122	122	2	21139	70.2	3	5.5	31.87	134	88

Appendix J - Pre and Post APOD T-Test (6-Month)

GET DATA /TYPE=XLSX/FILE='C:\Users\Bob\Desktop\PamApod30x2.xlsx'

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Score1	49.578	30	13.2314	2.4157
	Score2	62.033	30	8.7459	1.5968
Pair 2	Level1	1.87	30	.973	.178
	Level2	2.73	30	.640	.117
Pair 3	A1C1	6.927	30	1.1225	**.2049**
	A1C2	6.630	30	.9207	.1681
Pair 4	BMI1	31.4160	30	3.86708	.70603
	BMI2	29.5760	30	2.78728	.50889
Pair 5	Bpsys1	125.37	30	10.877	1.986
	BPsys2	122.90	30	13.777	2.515
Pair 6	Bpdia1	85.93	30	12.270	2.240
	BPdia2	81.97	30	11.722	2.140

Paired Samples Test

		Paired Differences				
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	
					Lower	Upper
Pair 1	Score1 - Score2	-12.4557	9.6662	1.7648	-16.0651	-8.8462
Pair 2	Level1 - Level2	-.867	.937	.171	-1.217	-.517
Pair 3	A1C1 - A1C2	.2967	.4422	.0807	.1316	.4618
Pair 4	BMI1 - BMI2	1.84000	2.93306	.53550	.74478	2.93522
Pair 5	Bpsys1 - BPsys2	2.467	14.529	2.653	-2.958	7.892
Pair 6	Bpdia1 - BPdia2	3.967	12.313	2.248	-.631	8.565

		t	df	Sig. (2-tailed)
Pair 1	Score1 - Score2	-7.058	29	.000
Pair 2	Level1 - Level2	-5.066	29	.000
Pair 3	A1C1 - A1C2	3.675	29	.001
Pair 4	BMI1 - BMI2	3.436	29	.002
Pair 5	Bpsys1 - BPsys2	.930	29	.360
Pair 6	Bpdia1 - BPdia2	1.764	29	.088

Appendix K - PAM and Attendant Data Spreadsheet

Date	PID	Score	Level	PAM1	PAM2	PAM3	PAM4	PAM5	PAM6	PAM7	PAM8	PAM9	PAM10	PAM11	PAM12	PAM13	BMI	A1C
9/29/2014	11111	36.8	1	1	2	2	1	2	2	3	2	3	3	3	2	2	34.98	7.3
2/23/2015	11112	43.7	1	2	3	2	2	3	3	3	3	2	2	3	3	2	30.11	7.0
10/2/2014	11113	40.7	1	3	3	3	2	3	2	5	2	2	3	2	2	2	30.20	6.8
3/12/2015	11114	60.6	3	4	4	4	3	4	3	3	3	3	3	3	3	3	29.10	6.4
9/28/2014	11115	33.0	1	2	2	3	5	1	1	2	2	5	2	3	2	2	31.25	6.1
3/1/2015	11116	51.0	2	3	3	3	3	2	2	3	2	3	4	3	3	3	31.00	5.5
10/5/2014	11117	36.8	1	3	3	2	1	1	2	5	5	1	2	3	3	3	36.68	7.9
3/9/2015	11118	51.0	2	4	4	3	2	2	3	3	2	2	3	4	4	3	34.78	7.6
8/10/2014	11119	45.3	1	3	3	3	2	2	2	2	3	4	4	2	3	2	33.40	8.3
3/2/2015	11120	60.6	3	4	4	3	2	3	3	3	4	4	4	3	3	3	28.11	7.1
10/9/2014	11121	58.1	3	4	4	2	5	3	3	3	5	5	3	3	3	3	35.55	10.4
3/12/2015	11122	70.2	3	4	4	3	5	3	3	4	5	5	4	4	4	2	28.64	9.7
10/6/2014	11123	51.0	2	3	3	3	3	5	3	3	3	3	3	3	3	3	34.20	8.4
2/16/2015	11124	60.6	3	4	4	4	4	3	3	3	2	1	4	4	3	3	28.98	8.4
10/15/2014	11125	36.8	1	3	3	3	2	2	3	3	1	1	2	2	2	2	26.78	6.4
3/5/2015	11126	60.6	3	3	3	4	5	3	4	3	2	3	4	3	3	3	26.61	6.4
8/11/2014	11127	33.0	1	2	2	3	1	1	2	3	3	1	2	2	2	2	27.22	6.0
12/15/2014	11128	58.1	3	3	3	3	3	3	4	4	2	3	3	3	3	3	28.80	5.9
10/9/2014	11129	58.1	3	3	3	3	5	3	3	4	5	3	3	3	3	5	29.37	6.3
2/19/2015	15781	70.2	3	4	4	4	3	3	4	3	3	3	3	4	4	3	26.52	6.2
9/22/2014	11130	58.1	3	4	4	3	3	3	4	3	5	3	3	3	3	3	31.10	6.3
3/2/2015	11131	68.8	3	4	4	3	3	4	4	4	3	4	4	3	3	3	26.18	6.2
9/29/2014	11132	33.0	1	2	2	3	5	1	2	2	5	2	1	3	2	2	35.78	6.0
3/9/2015	11133	51.0	2	3	3	4	3	2	3	3	3	3	3	3	3	3	30.10	6.0
10/9/2014	11134	60.6	3	4	4	3	4	4	3	4	3	3	3	3	1	5	34.55	6.0
3/9/2015	11135	51.0	2	3	4	4	4	4	3	1	4	3	1	2	2	2	32.95	5.8
1/30/2012	11136	67.8	3	4	4	4	3	4	4	4	2	3	3	3	3	3	34.20	9.1
8/2/2014	11137	77.7	4	4	4	4	3	4	4	4	3	4	3	3	4	4	32.21	7.6
10/9/2014	11138	60.6	3	4	4	5	3	5	3	5	3	3	3	3	3	3	35.56	8.2
3/12/2015	11139	67.8	3	4	4	4	3	2	4	3	4	3	3	3	4	3	31.11	8.0
9/29/2014	21111	36.8	1	3	3	2	2	2	1	2	2	2	3	3	2	2	28.45	7.3
2/23/2015	21112	60.6	3	4	4	4	4	3	2	3	3	3	3	3	3	3	29.10	7.3
10/2/2014	21113	45.3	1	3	3	3	2	2	5	3	3	3	3	2	2	2	32.80	7.2
3/12/2015	21114	70.2	3	4	4	4	3	3	3	3	4	4	4	4	3	3	29.40	6.7
9/28/2014	21115	60.6	3	4	4	3	1	4	4	4	3	2	3	4	3	3	33.12	6.6
3/1/2015	21116	70.2	3	4	4	4	3	4	4	4	3	2	4	4	3	3	29.30	6.2
10/5/2014	21117	67.8	3	4	4	4	4	4	4	4	4	5	2	2	4	1	36.25	8.3
3/9/2015	21118	70.2	3	4	4	4	4	4	4	4	3	3	3	5	3	5	34.24	7.1
8/10/2014	21119	36.8	1	3	4	2	1	2	2	3	2	5	2	2	2	2	28.11	6.5
3/2/2015	21120	60.6	3	4	4	3	2	2	3	4	3	4	3	3	3	3	28.39	6.4
10/9/2014	21121	60.6	3	4	4	5	3	4	3	3	2	5	3	3	5	3	27.10	6.8
3/12/2015	21122	67.8	3	4	4	4	3	4	3	3	3	4	3	3	3	3	29.90	6.8
10/6/2014	21123	70.2	3	4	3	4	5	4	4	4	3	3	4	3	3	4	29.89	6.1
2/16/2015	21124	60.6	3	4	3	3	2	3	4	4	4	3	4	3	3	3	27.61	6.1
10/15/2014	21125	43.7	1	3	4	1	4	4	3	3	3	5	1	5	1	1	32.08	6.6
3/5/2015	21126	60.6	3	4	4	3	3	4	3	4	4	2	2	3	3	4	31.42	6.5
8/11/2014	21127	40.7	1	2	2	3	1	3	3	3	2	2	3	3	2	2	33.04	6.4
12/15/2014	21128	60.6	3	3	3	3	3	3	4	3	3	3	4	3	3	3	33.34	6.1
10/9/2014	21129	40.7	1	3	3	3	1	2	2	2	3	3	3	3	2	2	24.50	6.0
2/19/2015	25781	51.0	2	4	4	4	1	3	3	3	3	3	3	2	3	2	23.25	5.9
9/22/2014	21130	70.2	3	4	3	4	4	4	3	4	4	5	3	3	4	3	22.21	5.8
3/2/2015	21131	70.2	3	3	3	4	4	3	3	4	4	3	4	4	3	4	24.58	5.8
9/29/2014	21132	70.2	3	4	4	4	5	4	3	4	3	3	4		3	4	32.13	6.9
3/9/2015	21133	70.2	3	4	4	3	3	4	3	4	3	4	3	3	4	3	30.13	6.2
10/9/2014	21134	33.0	1	2	3	2	1	2	2	2	2	2	2	2	2	1	28.19	6.0
3/9/2015	21135	45.3	1	3	3	3	2	2	3	3	2	3	3	3	2	2	26.21	6.1
1/30/2012	21136	60.6	3	4	3	4	2	3	3	4	4	2	3	4	3	3	36.89	6.1
8/2/2014	21137	70.2	3	4	4	4	4	4	4	4	2	3	3	4	3	3	31.87	5.5
10/9/2014	21138	40.7	1	3	3	2	5	2	3	2	2	3	2	3	2	2	26.90	5.7
3/12/2015	21139	70.2	3	4	4	4	3	3	3	4	3	4	4	4	3	3	33.34	6.4