Marketplace Clinics Complementing Diabetes Care for Urban Residing American Indians

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Abstract

Introduction: For several decades, the Minneapolis American Indian population has experienced limited health care access and threefold diabetes health disparity. As part of an urban health initiative, the marketplace clinics located in nearby CVS, Target, and Supervalu stores committed financial support, providers, certified educators, and pharmacy staff for a community-based diabetes support group. Objectives: To measure the extent to which collaborating marketplace clinics and the community-based support group expanded diabetes care and provided self-management education for this largely urban Indian neighborhood. Methods: A controlled quasi-experimental study and 3-years retrospective analysis of secondary data were used to test whether the Minneapolis marketplace clinics and the community diabetes support group participants (n = 48) had improved diabetes health outcomes relative to the comparison group (n = 87). The marketplace complemented intervention group employed motivational interviewing and the patient activation measure (PAM®) in coaching diabetes self-care and behavioral modification. The federally funded comparison group received only basic self-management education. Results: T tests and effect sizes were used to quantify the difference between the study intervention and comparison groups. Statistical significance was determined for the following outcome variables: A1C (P < .01), body mass index (P < .04), and PAM® (P < .001). Discussion: Includes strengths, limitations, and future study recommendations. Conclusions: Positive effects of marketplace clinics and community health complementation were found with regard to improved blood glucose control, weight loss, and healthful lifestyle adaptation. Primary care and community health improvements could be realized by incorporating patient activation with diabetes prevention programs for the urban Indian two-thirds majority of the United States 5 million American Indian population.

Keywords

access to care, American Indian, urban Indian, diabetes, marketplace clinic, complementary care, community-based, patient activation, self-management education, community health

Introduction

The American Indians population in Minneapolis, Minnesota has experienced limited health care access and 3-fold diabetes health disparity. Most urban residing American Indian persons prefer to be referred to as “urban Indian” and such designation will be observed throughout this article.¹ 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, Target, and Supervalu stores committed financial support, certified educators, and pharmacy staff for the community-based support group. In our research, we focused on determining the extent to which marketplace clinics can expand health service access and promote complementary care for community-based diabetes support groups, such as A Partnership of Diabetics (APOD).²

Current national and regional vital statistics had already indicated a diabetes health disparity among the Minneapolis American Indian population. National Health Survey (2010) reports show the 14.3% Minneapolis urban Indian
diabetes prevalence is more than 2.5 times higher than the general population (5.3%). The Urban Indian Health Institute, predicted that such disparate rates would have serious consequences for the Minneapolis American Indian population of 20,000, including the nearly 3000 individuals and families suffering from diabetes-related illnesses.

The Minneapolis metropolitan area has many highly regarded health services and several outstanding health care leaders. Stressing the need for universal health care, former Health Partners and Kaiser CEO, George Halvorson proclaimed, “We need the courage to actually reform care” and bring health market forces together for the benefit of everyone. Historically, for many upper Mississippian Native people, such transformative leadership was engendered by legendary Ojibwe Chief Hole-in-the-Day. The American Indian Movement (AIM) and its chairman Clyde Bellecourt have sponsored and long sustained Minneapolis urban Indian health care services. The 2015 study was conducted in concert with the principal author’s dissertation review committee. The Walden University Institutional Review Board approval number is 02-11-15-0170571.

Minneapolis has preeminent health care resources and has many urban health initiatives aimed at health disparity reduction. Based on their research, distinguished Health Partners family medicine physicians published evidence that clinical practices and community-based programs can work well together in advancing preventive care and improving health outcomes. Mayo Clinic researchers described how lower costs may be achieved by referring chronic patients to community-based health care programs. Predictions that CVS/MinuteClinics disruptive innovation would emerge as the champion health reform implementer have not materialized. CVS has pulled out of many inner-city markets and has seemingly left the low-income marketplace to public health providers. The CVS/Allina strategic partnership is attempting to fill the void by instituting a community health promotion program referred to as the Backyard Initiative. Our study evaluates whether such community health promotion, self-management education, and activation can have positive and beneficial effects for all, including the urban Indian population.

Methods

As applied research, we compared the diabetes health outcomes between the marketplace complemented group (APOD) and the federally funded Urban Indian Health Organization (UIHO). The central research question asked whether Minneapolis marketplace clinics could broaden their business plans and complement community-based diabetes care. Quantitative study methods consisted of 2 parts. First, we tested the extent to which the diabetes clinical outcome measures improved more for the marketplace-complemented, community-based group than for the federally-funded group. Second, we queried the community-based study group patient activation measure (PAM®) scores and attendant diabetes outcome measures. During the preliminary data review, we determined that a classical experimental design was not a good fit for this sample population. Questions regarding the studied variables normal distribution, nonrandom sample selection, and nonproximal control matching required strategies for quasi-experimental studies.

The quantitative study was a quasi-experiment with a comparison group and repeated measures statistical analysis. The study and comparison groups included Minneapolis, Phillips community, medically underserved, and urban Indian diabetes patients. The service area involved marketplace clinics and other clinics both with and without a community-based support group. In addition to the complemented care, and support group designations, the variables included hemoglobin (A1C) percent at test date (year/month), body mass index (BMI), blood pressure (BP), and the patient activation (PAM®) score.

Selection and Description of Participants

Participants were recruited from the Minneapolis urban Indian neighborhood through postings, newspaper notices, and social media announcements. Adult diabetic and prediabetic 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 required completing a brief survey. The study group was composed of marketplace clinics and APOD members who participated in the diabetes management program and completed the pre- and post-PAM® survey.

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

Technical Information

During the community field work, informed consent, a complimentary PAM® license, and an APOD data use agreement was secured. The research was conducted collaboratively with community and CVS/Allina corporate staff; while we worked with and learned from health care practitioners. Throughout this study, National Institutes of Health human subjects’ protection and American Diabetes Association (ADA) quality standards were applied.
The quality standard of diabetes care is set by the ADA Standard of Medical Care in Diabetes, which calls for complementary community-based diabetes self-management and support. The main studied metric was the ADA (A1C) standard of less than 7.0. Comparative measures also included BMI and BP indicators.

Research articles regarding 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. The Likert-type, PAM® questionnaire as shown in Figure 1 is a highly regarded, valid, and reliable instrument applied to over 180 organizations worldwide, including a prominent Minneapolis study.17

We investigated alternative quasi-experimental strategies that have application for nonequivalent groups. Figure 2 shows APOD case and UIHO comparison group values such as A1C to be evenly distributed with similar standard deviations.

The expected PAM® effect size was based on information from 5 pertinent articles. The combined statistical tests determined an effect size slightly above medium. The medium ($d = 0.65$) effect size, statistical power, and anticipated attrition were the primary factors considered in sample size calculation. For a 95% confidence level and 0.80 power, the $t$ test for independent samples yielded an 80-participant sample with at least 40 members in each group. Because of the difficulties in accessing health care due to the socioeconomic limitations of this population, a 20% buffer was added to the case group (8 additional participants) to help minimize attrition (n = 48 cases + 87 comparisons = 135 members).

**Statistics**

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). The IBM Statistical Package for Social Sciences (SPSS) version 21 was applied to measure the size of the APOD self-management intervention effect compared to the UIHO group. Hypothesis testing was conducted for 3-year compared groups independent samples and 6-month case-group related samples. Repeated measures were conducted with a $t$ test statistic and investigated further with Cohen’s $d$ effect size determination.

**Results**

For the 3-year quasi-experiment, the independent categorical variable was participant group (APOD or UIHO), and the dependent variables were (A1C, BMI, and BP) clinical outcomes. The number of participants was 135, with 48 cases and 87 comparisons. The PAM® instrument ranked participants’ change propensity. A repeated-measures case study was performed to analyze the 3-year, and 6-month pretest-posttest PAM® scores and attendant A1C, BMI, and BP data.

The central research question was: Did the complemented APOD study group manage their A1C, BMI, and BP better than the nonparticipating UIHO comparison group? The second research question considered whether the APOD case group’s PAM® scores and diabetes outcomes improved. The hypothesis is that the complemented APOD intervention group, having participated in the PAM® motivational interviewing and diabetes self-management education, would show greater improvement than the UIHO nonintervention group. Table 1 displays the APOD intervention and UIHO nonintervention groups comparison from baseline (2012) to post intervention (2014).

Regarding the 3-year comparison between groups, at baseline year 2012, the (APOD) intervention group had A1C mean values ($M = 7.5, SD = 1.9$) and BMI values ($M = 34.2, SD = 4.6$). The (UIHO) non-intervention group had A1C mean values ($M = 7.8, SD = 2.0$) and BMI values ($M = 34.9, SD = 7.8$). The APOD intervention group ended the 3-year study (end of year 2014) with a moderately reduced A1C mean value ($M = 6.9, SD = 2.13$) compared with the nonintervention group ($M = 8, SD = 2.10$). The $t$ tests were statistically significant at $t(135) = −2.895, P = .004$. Between group mean difference by A1C mean and standard deviation ($M = −1.1, SD = 2.17$) found a medium ($d = 0.51$) intervention effect size.

The intervention group also ended the study with a lower BMI ($M = 32.1, SD = 4.01$) compared with the nonintervention group ($M = 34.7, SD = 7.50$). This difference was significant at $t(135) = −2.188, P = .03$. The comparison between groups for mean weight loss by BMI found a small ($d = 0.39$) intervention effect size. The 3-year comparison between groups for BPsys (systolic BP) and BPdia (diastolic BP) was negligible ($d = 0.11$ and 0.003).

Pre- and post-PAM® comparison within the APOD intervention group following the 3-year study provided an opportunity to explore the second research question: What is the effect of the PAM® activated APOD intervention on clinical outcomes? During the first 6 months of 2015, a more intensive marketplace complementation, motivational interviewing, and participant activation was conducted. Repeated measures of PAM® score, level, and attendant data were recorded at 3, 3½, and 3½ years after the intervention. Table 2 presents the PAM® and attendant data (A1C, BMI, and BP) pre- and postintervention results.

Participants who actively participated in APOD experienced improvement in the PAM® score ($M = 12.4, SD = 9.67$) and level ($M = 0.86, SD = .94$). This pre- and posttest difference in terms of changes in patient activation was significant, $t(30) = −7.058, p < .001, d = 1.29$. The PAM®
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.

|   | Statement                                                                 | Disagree | Disagree | Agree | Agree Strongly | N/A |
|---|---------------------------------------------------------------------------|----------|----------|-------|----------------|-----|
| 1 | When all is said and done, I am the person who is responsible for taking care of my health | Disagree | 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 | Disagree | Agree | Agree Strongly | N/A |
| 3 | I am confident I can help prevent or reduce problems associated with my health | Disagree | Disagree | Agree | Agree Strongly | N/A |
| 4 | I know what each of my prescribed medications do | Disagree | 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 | 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 | 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 | Disagree | Agree | Agree Strongly | N/A |
| 8 | I understand my health problems and what causes them | Disagree | Disagree | Agree | Agree Strongly | N/A |
| 9 | I know what treatments are available for my health problems | Disagree | Disagree | Agree | Agree Strongly | N/A |
| 10 | I have been able to maintain (keep up with) lifestyle changes, like eating right or exercising | Disagree | Disagree | Agree | Agree Strongly | N/A |
| 11 | I know how to prevent problems with my health | Disagree | Disagree | Agree | Agree Strongly | N/A |
| 12 | I am confident I can figure out solutions when new problems arise with my health | Disagree | 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 | Disagree | Agree | Agree Strongly | N/A |

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**Figure 1.** Patient Activation Measure PAM® survey instrument.
level metric was seen to improve from level 2 (building knowledge and confidence) to a rather confident, self-care level 3 (taking action). At 6 months after the intervention, there were positive changes in A1C ($M = -0.3$, $SD = 0.44$) and BMI ($M = -1.84$, $SD = 2.93$). Weight loss was substantial and strongly reflected the 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 sizes.

Discussion

This study has both strengths and limitations to be considered when interpreting the results.

Important strengths were the marketplace clinics financial support and engagement; as well as APOD participants’ dedication and willingness to share diabetes clinical and behavior information. During the 3-year study period, the CVS/Allina strategic partnership provided financial support of $50,000 per year and complemented community-based diabetes care. Observable management interaction saw many instances where CVS, Target, and Supervalu marketplace clinics and their administration, providers, certified educators, and pharmacy staff engaged with and reached out to medically underserved and urban Indian persons with diabetes.

Additionally, the standardized PAM® survey instrument provided a strong study framework and a unifying influence among study researchers, group coordination, and participants. When the survey questions were read, discussed, and understood by the APOD participants, there was acceptance and consensus. The collective opportunity of helping one another was compelling. Not feeling alone with one’s problems; while instead cultivating physical activity, better diet, and not delaying seeking care empowered proactive consumer behaviors such as preparing a list of questions for a doctor visit, and patient-activated self-management practices. The PAM® survey instrument was used to coordinate APOD motivational interviewing practices and quantify elements of access, cultural awareness, and continuity of care. Throughout the study, this community-based support group led by example to build a complementary network for this cross-cultural, medically underserved, and urban Indian community. The marketplace clinics continued outreach, and APODs commitment facilitated an ability to conduct a sufficiently large ($n = 135$) and lengthy 3-year comparative evaluation.

There are several limitations to our study. First, we had a relatively small population and sample size. Second, our secondary data use agreement with the APOD Coordinator, was limited to participant responses to the PAM® survey and deidentified APOD attendance data with corresponding A1C, weight, height, and BP measures. Perhaps because of the relatively small number of participants, there was sensitivity and reluctance to provide demographic characteristics such as age, gender, or other potentially identifiable information. Because of the limited data set restriction, we were unable to fully address any demographic differences among the intervention and nonintervention groups. Going forward, more specific group comparative analysis should be done with a larger sample size and a more comprehensive data set to explore possible subgroup differences.

Conclusions

This quasi-experimental with a comparison group study was conducted primarily to examine the effect of diabetes patient empowerment, activation, and community-based support with regard to improved A1C, BMI, and BP outcomes. Comparison between groups by diabetes trend (A1C) showed a statistically significant ($P < .01$), medium intervention effect size ($d = 0.51$) that is comparable to similar cultural
The 3-year study found that the diabetes intervention was statistically significant ($P < .04$), yet small for BMI ($d = 0.39$) and negligible for BP. The APOD intervention group study found significantly improved 6-month pretest-posttest A1C ($P < .001$), BMI ($P < .002$), and PAM® measures, as well as large effect sizes.

The advantages of marketplace clinics complemented community-based diabetes care were verified, and new insights revealed the positive effect of the collaborative self-management intervention on diabetic patient activation levels. The marketplace engagement and financial support provided APOD start-up resources. In fact, the CVS/Allina strategic partnership provided financial support of $50,000 per year and complemented APOD community-based diabetes support. For nearly 4 years, APOD provided leadership, social support, and cross-cultural community outreach to build a complementary network.

To the best of our knowledge, this is the first time that motivational interviewing and the PAM® was applied as a community-based self-management intervention in a cross-cultural setting including urban Indian persons with diabetes. There are hundreds of articles confirming that the urban Indian subpopulation lacks primary health care and is particularly at risk of increased diabetes incidence without expanded health access. However, very few evidence-based research articles, 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. The clinical significance of this study is that it accepts the urban Indian health disparity challenge and commits action research toward urban Indian health improvement.

The positive social implications drawn from these results are 2-fold. First, the marketplace and community-based complementary network offers resources, increased access to quality care which may have benefit in reduced diabetes health disparity. The second benefit comes as marketplace resources are matched with Indian Health Service resources and steps are taken to share these pooled resources more equitably with the urban Indian two-thirds majority of the United States’ 5 million American Indian population.

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### Declaration of Conflicting Interests

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**Table 1.** Case-Control Group Means Comparison by Outcome (3-year)

| Group            | n  | A1C, % | BMI, kg/m² | BPsys, mm Hg | BPdia, mm Hg |
|------------------|----|--------|------------|--------------|--------------|
| APOD Pre (2012)  | 48 | 7.5    | 34.20      | 128.30       | 77.80        |
| APOD Post (2014) | 48 | 6.9    | 32.09      | 127.00       | 80.04        |
| UIHO Pre (2012)  | 87 | 7.8    | 34.90      | 126.80       | 77.30        |
| UIHO Post (2014) | 87 | 8.0    | 34.68      | 127.35       | 80.35        |
| Mean difference  |    | -1.1   | -2.59      | -0.65        | -0.31        |
| SD               |    | 2.17   | 6.69       | 10.99        | 10.90        |
| $P$              |    | <.01   | <.04       | >.80         | >.80         |

Abbreviations: 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 in kilograms divided by square of their height in meters; BPsys, blood pressure systolic; BPdia, blood pressure diastolic; APOD, A Partnership of Diabetics; UIHO, Urban Indian Health Organization.

**Table 2.** APOD, PAM® Score Comparisons by Level and Clinical Outcome (6-month)

| Group          | n  | PAM® Score | PAM® Level | A1C, % | BMI, kg/m² | BPsys, mm Hg | BPdia, mm Hg |
|----------------|----|------------|------------|--------|------------|--------------|--------------|
| APOD pre-PAM®  | 30 | 49.6       | 1.87       | 6.90   | 31.42      | 125.40       | 85.93        |
| APOD post-PAM® | 30 | 62.0       | 2.73       | 6.60   | 29.58      | 122.90       | 81.97        |
| Means difference | 30 | 12.4 (+1)  | 0.86       | -0.30  | -1.84      | -2.50        | -4.00        |
| SD             |    | 9.67       | 0.94       | 0.44   | 2.93       | 4.50         | 12.30        |
| $P$            |    | <.001      | <.001      | <.002  | <.003      | >.36         | >.087        |

Abbreviations: 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 in kilograms divided by square of their height in meters; BPsys, blood pressure systolic; BPdia, blood pressure diastolic; APOD, A Partnership of Diabetics; PAM®, patient activation measure.
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Robert E. Hoye, PhD, FAAMA, FRSH, is in his 29th year as a Faculty Mentor in the doctoral programs leading to a PhD in Health Services and Public Health at Walden University. He was named The Outstanding Faculty Member in 2000 and received The Bernard L. Turner Award in 1994. He currently serves as Kentucky State Director for the American Academy of Medical Administrators, where he is also recognized by being named a Fellow in the Academy. He was further honored by being named a Diplomat in Healthcare Administration for extraordinary service to the profession in 1994. He received the Healthcare Statesman of the Year Award in 1992. He served as Chair of the Editorial Board of AAMA for a 10-year term. He holds the distinction and title of Professor Emeritus from the Graduate School at the University of Louisville. Distinguished Visiting Professor, School of Public Health, San Diego State University, California.
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