ANALYSIS ON THE EFFICACY OF DIABETES SELF MANAGEMENT EDUCATION AMONG AN UNDERSERVED POPULATION

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BACKGROUND

Diabetes mellitus is a common and serious disease afflicting over 30 million people in the USA. It directly caused 80,000 deaths in 2015 and was a contributing factor to over 250,000 more. Diabetes will primarily manifest with altered blood sugar, but its complications include nerve damage, kidney damage, blindness, ulcers, infection, heart disease and stroke. In 2014 there were 7.2 million hospitalizations and 14.2 million emergency room visits for diabetes related complications amounting to $245 billion dollars in health care expenditures.

Individuals of lower socioeconomic status bear a disproportionate burden of diabetes. Reduced access to regular doctor's visits, healthy food and safe places to exercise results in a higher rate of occurrence and increased mortality compared to higher-income patients.

Diabetes currently has no cure, and management must involve a thorough combination of medications, diet control, exercise, and regular follow-up with a **physician**. Diabetes Self Management Education (DSME) programs have been designed to improve the self-efficacy of patients with diabetes, helping them to learn strategies to better manage their own disease.

OBJECTIVE

To evaluate the effects of attendance to a Diabetes Self-Management Education program on comprehensive diabetic control in an underserved population.

Primary Outcome:

Comprehensive diabetic control, a passing value in ≥70% of variables

Secondary Outcomes:

- A1c
- Blood Pressure
- ACE Inhibitor
- Statin
- Lipid Panel
- Kidney Function Test
- Vaccinations
- Smoking
- Aspirin
- Exercise
- Diet
- Foot Exam
- Eye Exam

METHODS

Subjects were recruited through a chart review at the St. Vincent de Paul free medical clinic.
Inclusion Criteria:
Patients ≥18yo who have diabetes
Attended at least one primary care visit for diabetes
Had been transitioned from the clinic ≥6 months prior
Exclusion Criteria:
<18yo, attended 1-3 DSME classes, had DM but did not have primary care in the clinic
The treatment group consisted of participants who had attended ≥4 of the 7 classes with the DSME program.
The control group consisted of participants who did not attend any DSME classes.
13 variables that make up the core quality metrics for diabetes care were evaluated to determine comprehensive control.
Patients are considered to have diabetic control with a passing value in ≥70% of variables
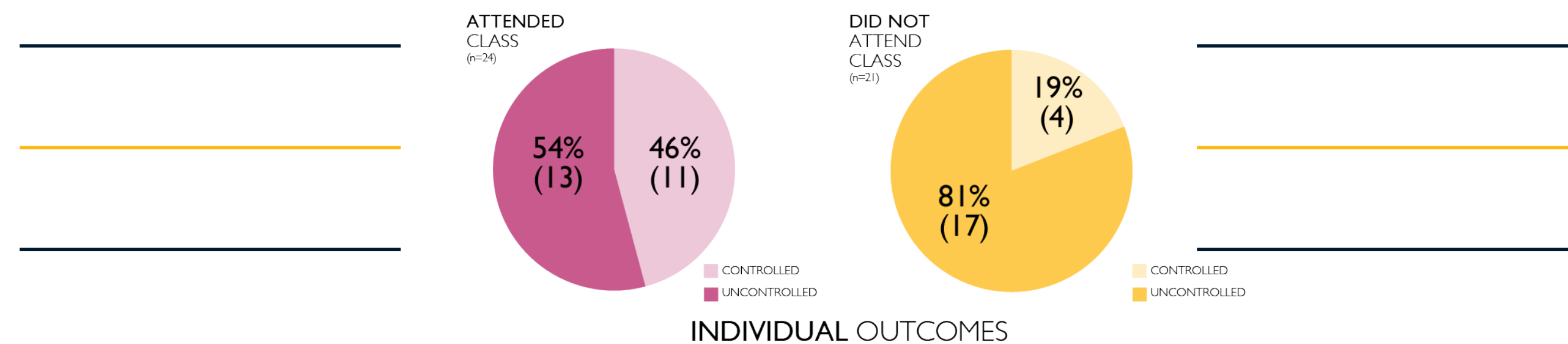Variables are considered a pass if the following criteria are met.

- A1c ≤8%
- Blood Pressure <140/90
- ACE Inhibitor if there is evidence of hypertension (BP ≥140/90) or microalbuminuria
- Lipid Panel on file
- Statin if ≥40yo, or <40yo with a cardiovascular disease risk factor
- Foot Exam within the last 12 months
- Eye Exam within the last 24 months
- Kidney Function Test within the last 12 months
- Vaccination: Up to date on influenza, pneumonia and hepatitis B#1
- Not smoking
- Aspirin if 10-year ASCVD risk ≥ 10%
- Exercise ≥150 minutes per week
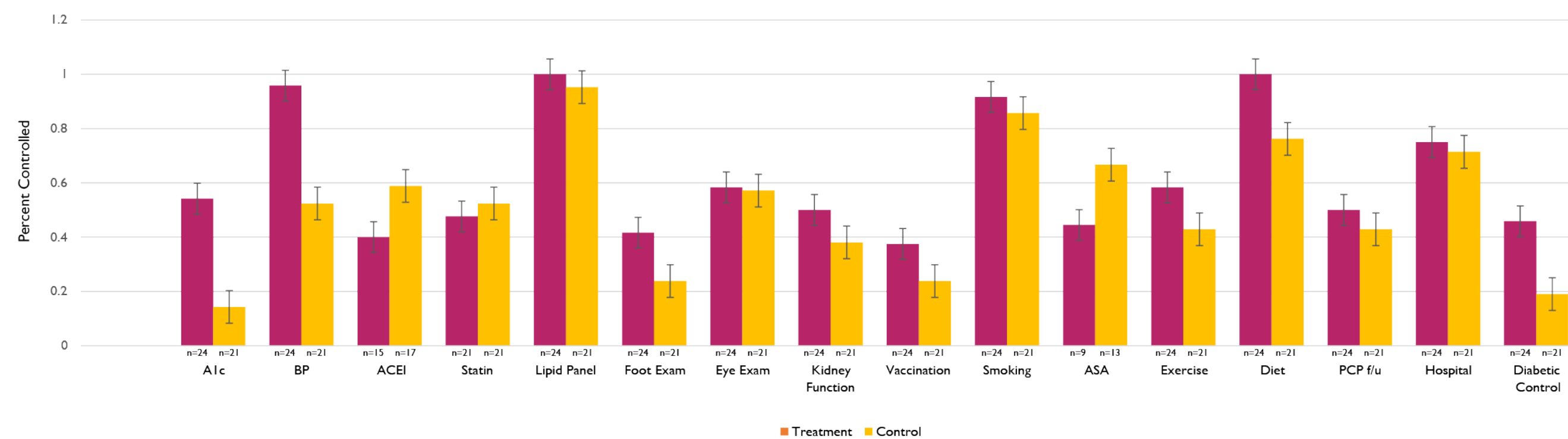- Diet modifications to control blood sugar

BASELINE CHARACTERISTICS

Group	Age	Sex		BMI	A1c			Language		Ethnicity		Months since	
		Female	Male		First	Transition	Latest	Spanish	English	Hispanic	Caucasian	Last Visit	Last Class
Treatment	53±8.83	44%	56%	29.1±7.47	8.4±2.63	6.7±1.41	7.5±2.59	96%	4%	100%	0%	18±7.51	18±9.46
Control	56±9.97	52%	48%	28.2±6.84	9.7±2.16	7.9±2.43	10.8±2.55	95%	5%	95%	5%	23±7.92	
Total	55±9.72	49%	51%	29.1±7.11	9.1±2.43	7.4±2.12	9.2±2.71	96%	4%	98%	2%	20±7.79	18±9.46

RESULTS

ATTENDED CLASS (n=24)
54% (13)
46% (11)
CONTROLLED
UNCONTROLLED

DID NOT ATTEND CLASS (n=21)
19% (4)
81% (17)
CONTROLLED
UNCONTROLLED

INDIVIDUAL OUTCOMES

CONCLUSIONS

Overall, the DSME program was found to significantly affect the long-term diabetic control among patients who attended. 46% of patients who attended the class were found to have good diabetic control compared to only 19% among those who didn't attend.

- A subject who attended the DSME program was found to be:
- 2.4 times more likely to have good overall diabetic control
- 2.4 times more likely to have a healthy A1c
- 3.9 times more likely to have a healthy blood pressure
- 1.3 times more likely to have adequate exercise
- 1.3 times more likely to modify their diet

DISCUSSION

The results of the study show that attendance to a DSME program more than doubled an individual's odds of maintaining diabetic control. The design of the study did not measure the rates of diabetic complications, but with the assumption that the changes in metrics could even cause a 10% reduction in adverse events, then this type of education nationwide could prevent 33,000 deaths each year and reduce yearly healthcare costs by $24.5 billion.

Although the results of the study were significant, it should be noted that only 46% of patients in the treatment group achieved good diabetic control. This is not an ideal number, and changes have been made to the SVdP primary care clinic so patients will be transitioned in a more effective manner to ensure continuity of care at the clinic they follow up at.

- Weaknesses of the study include:
- A small sample size
- Bias in motivated patients vs patients looking for medical care
- Short interval to follow up. 5 years post intervention would be ideal
- Change in leadership in the clinic – improved primary care led to improvements in patient care for participants in the second half of the study
- Not generalizable
- The clinic was a free clinic
- The clinic was a temporary clinic
- Race was predominantly Hispanic

References

1. American Diabetes Association. Standards of medical care in diabetes- Diabetes Care. 2017;37 Suppl 1:S14-80.
2. De Silva AP, De Silva SH, Haniffa R, et al. A survey on socioeconomic determinants of diabetes mellitus management in a lower middle income setting. Int J Equity Health. 2016;15:74-016-0363-3.
3. Lasser KE, Himmelstein DU, Woolhandler S. Access to care, health status, and health disparities in the united states and Canada: Results of a cross-national population-based survey. Am J Public Health. 2006;96(7):1300-1307.
4. Seol H, Thompson M, Kreider KE, Vorderstrasse A. Diabetes self-management quality improvement initiative for medically underserved patients. J Nurs Care Qual. 2016.
5. Stolar MW. Defining and achieving treatment success in patients with type 2 diabetes mellitus. Mayo Clin Proc. 2010;85(12 Suppl):S50-9.
6. Centers for Disease Control and Prevention. National diabetes statistics report: Estimates of diabetes and its burden in the united states. 2017:1-12.

Acknowledgements