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# A Pilot Study Evaluating the Effectiveness of the National Diabetes Prevention Program in an Urban Medically Underserved Community

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## Abstract

This study evaluated the effectiveness of participation in the National Diabetes Prevention Program (NDPP) for weight reduction in a sample of prediabetic individuals in an urban medically underserved community.

**Background:** The NDPP was developed from a large study demonstrating a reduced risk for diabetes in prediabetic individuals who participated in an intensive lifestyle intervention program. **Methods:** Participants received 16 group sessions aligning with the core curriculum of the NDPP per the Centers for Disease Control (CDC). A pre-test, post-test paired group t-test was completed to evaluate the change in mean weight and body mass index (BMI) at the beginning and end of the program. Correlational analyses were completed to evaluate the association between weight change, age, gender, number of sessions attended, and total minutes of physical activity.

**Results:** Twelve participants initiated the program, and eight completed at least four of the 16 sessions, consistent with the CDC's definition of program completion. There was a significant difference in pre-weight, post-weight and BMI ( $p < 0.05$ ). Weight loss was independent of age or gender. Positive correlations were found between weight loss and number of sessions attended ( $p < 0.05$ ), and between weight loss and total minutes of physical activity ( $p < 0.05$ ).

**Conclusions:** Participation in the core portion of the NDPP significantly reduced weight and BMI in a group of prediabetic individuals in an urban, medically underserved community, with weight loss unrelated to age and gender. A greater level of weight loss was associated with higher levels of program participation through session attendance and physical activity. There was an observable discrepancy between the final program weight and the lowest weight attained, suggesting the importance of considering weight fluctuations in evaluating program effectiveness, particularly in communities where medical and psychosocial impacts on weight loss are likely to occur.

## Introduction

- Type II diabetes is a worsening problem in the U.S., with increases in both prevalence and incidence since the 1990's, particularly in minority racial and ethnic groups.
- Individuals with prediabetes have an increased risk for developing diabetes and its complications, including cardiovascular disease. The NDPP is recommended by health care organizations as standard of care for prediabetics to reduce the risk for diabetes.
- Ward 8 in Washington, D.C. has high rates of poverty, low education, and high unemployment. The prevalence of diabetes and obesity in Ward 8 are nearly twice that of the city of D.C. as a whole. The population of Ward 8 has limited grocery and food options compared to other areas.
- Integrating the NDPP into existing health services at a federally-qualified health center (FQHC) within Ward 8 would improve access to and quality of care for prediabetics in this community.
- The CDC requires that participants lose a minimum of 5% of their body weight by the end of the core program (first 6 months) in order for organizations to receive full recognition. This may be challenging in low-income communities such as Ward 8 where other medical and psychosocial issues are more prevalent.

## Methods

### Study Aims:

Evaluate the effectiveness of the NDPP in reducing risk for diabetes

- Through reduction in weight, BMI, blood glucose and HgbA1c

Determine the impact of the NDPP on physical exercise and calorie intake

Evaluate the financial and logistical sustainability of the NDPP within the FQHC setting

### Study Design:

Pre-test, post-test paired group

Variables: Weight, BMI, random blood glucose, HgbA1c, total number of sessions attended, lowest weight attained, weekly calorie intake, and demographic information

Participants recruited from pre-identified prediabetics within the FQHC in Ward 8.

16 sessions of the CDC's 2012 NDPP core program

## Results

### Pre- vs. Post-Program Data, $n = 12$

	Pre-Program Mean	Pre-Program SD	Post-Program Mean	Post-Program SD	Sig. (2-tailed)
Weight (pounds)	227.1	61.4	221.8	59.2	<b>0.022*</b>
Body Mass Index	36.7	7.0	35.9	6.9	<b>0.021*</b>
HgbA1c	6.0	0.2	6.1	0.2	0.395
Random Blood Glucose	106.3	12.7	113.8	26.6	0.521

\* =  $p < 0.05$

### Pre- vs. Post-Program Data, $n = 8$

	Pre-Program Mean	Pre-Program SD	Post-Program Mean	Post-Program SD	Sig. (2-tailed)
Weight (pounds)	234.5	65.0	227.1	62.0	<b>0.030*</b>
Body Mass Index	37.5	6.7	36.3	6.5	<b>0.030*</b>

\* =  $p < 0.05$

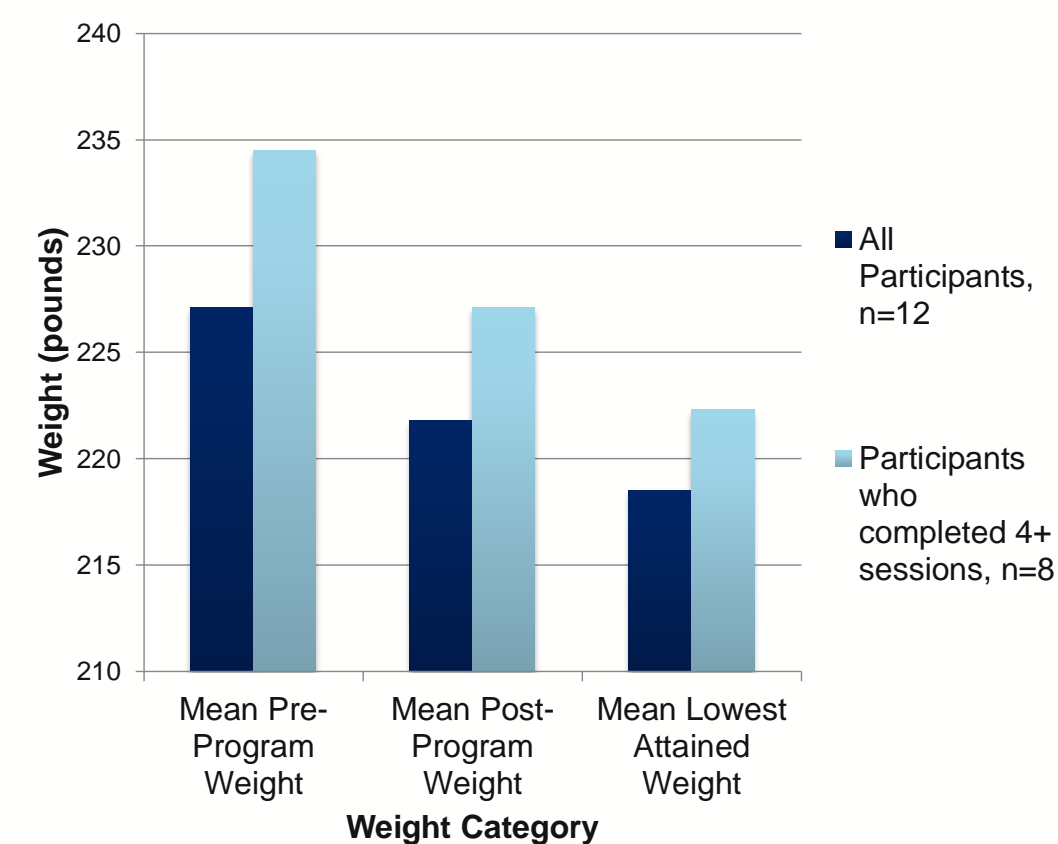
### Participant Data:

- 13 identified prediabetics were recruited from patients within the FQHC
- 12 of these 13 initiated the program
- 8 completed 4 or more sessions

### Demographics:

- Mean participant age: 56 years (range 37-70 years)
- All participants were African American
- 77 percent were female, 23 percent were male

### Comparison of Mean Weights



### Correlational Analyses, Sig. (2-tailed), $n = 12$

Measure	1	2	3	4	5	6
1. Number of Sessions Attended	---					
2. Weight Change Pre- to Post-Program	0.151	---				
3. Weight Change Pre-Program to Lowest Weight Attained	<b>0.018*</b>	<b>0.021*</b>	---			
4. Total Minutes Physical Activity	<b>0.005*</b>	<b>0.006*</b>	0.088	---		
5. Gender	0.508	0.788	0.939	0.616	---	
6. Age	0.068	0.761	0.394	0.396	0.533	---

\* =  $p < 0.05$

## Conclusions

The NDPP was successfully integrated into the services provided by an existing FQHC within the medically underserved community of D.C.'s Ward 8, consistent with standard of care for prediabetics.

There was a statistically significant improvement in both weight and BMI in the prediabetic individuals who participated in the core program of the NDPP, irrespective of gender or age.

In this community where medical and psychosocial comorbidities are present, the results suggest the importance of considering participants' lowest weight attained versus final session weight in determining the effectiveness of the program.

Further research should consider the use of a control group, a larger sample, and the full one-year NDPP program to evaluate program effectiveness in this community. Comorbid medical and psychosocial issues should also be considered to better determine barriers to program participation and weight loss.

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