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Nurse-Led Peer Facilitated Diabetes Prevention and Early Intervention Program

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Learning Objectives

At the end of this presentation, learners will:

I. Develop knowledge and skills to implement an effective Diabetes Prevention Program (DPP) in marginalized population(s); and

II. Identify at least three common implementation barriers and facilitators in translation of evidence-based diabetes prevention research to practice.

Content

I. Background

Prediabetes:

- Antecedent to type 2 diabetes [T2D]
- Emerging threat to the nation's health
  - Adult rate ↑sed from 20% in 2012 to 34% in 2015
- 86 million people in the U.S. have prediabetes
- Only 9 million are aware of diagnoses
- ↑ prevalence in men (36.6%) than women (29.3%)
- ↑ impact on marginalized population (i.e., homeless, unemployed)
- Projected to rise by 40% in 2030

Burden of Diabetes & Comorbidities

- Strong correlation for diabetes and CVDs
- Leading causes of death and disability in the U.S.
  - #1 - Heart disease (635,260 Deaths)
  - #5 - Stroke (142,142 Deaths)
  - #7 – Diabetes (80,058 Deaths)
- Drivers of ↑sed health expenditures
- Diabetes → $237 billion per year
- Heart Disease & Stroke → $199 billion per year
- Projected will further ↑ burden

Significance of Diabetes Prevention Program (DPP)

Integration of DPP will:

- Delay or revert progression of prediabetes
- Encourage sustained lifestyle changes
- Empower men to better take care of their health
- ↓ Cost of prevention (less than $500 per person per year)
- Bridge current gaps in health care services
- ↑ Health-related quality of life
- ↑ Stakeholders' satisfactions
- Towards best practices

Risk Factors

Non-modifiable

- Age
- Gender
- Genetic Predisposition
- Environment

Modifiable

- Overweight/Obesity
  - Poor eating habits
  - Sedentariness
- Prediabetes
- Smoking
- High blood pressure
- High cholesterol (hyperlipidemia)

II. Defining Local Problem

- **Target Population**
- Men
- Aged 19 to 61 years
- Mostly African Americans
- Formerly homeless
- Past exposures to substance mis-use & food insecurity
- High rates of smoking
- Poor access to preventive health

Risks	Target Population (Men) %		Men AA %	Men City %	Men State %	U.S %
Smoking	83.0		20.9	27.6	16.8	17.5
Obesity	54.0		38.4	26.7	27.6	35.0
High B/P	Pre-hypertension (Assessed by Nurse)	Diagnosed Hypertension (On Treatment)				
	39.0	14.0	41.3	38.1	32.0	30.0

III. Current vs. Best Practices

Current Practice

No DPP

Prevention of Diabetes

Lifestyle modification

- Healthy Eating

- Stop Smoking
- ↓ Sugar Sweetened Beverages
- Regular Exercise

Best Practices in DPP

Best Practices in DPP will offer effective programs to:

- Delay or avert progressions of T2D
- Reduce cost of diabetes treatments
- Decrease disease related complications

No DPP

- ≈ 40% will develop T2D in 4 to 5 years (Tuso, 2014)
- ↑sed cost of treatment vs. ↓sed cost of prevention

IV. Barriers & Facilitators

Anticipated Barriers	Facilitators
▪ Resistance to embrace recommended lifestyle changes	Peer facilitation can help promote behavioral changes
▪ Culture and social norms	Peer facilitation can increase program relevance and flexibility
▪ Resource limitations	Peer facilitation can reduce cost of program implementation and sustainability
▪ Hierarchical Leadership	Supportive internal stakeholders

V. Purpose Statement

To evaluate the effect of a nurse-led DPP on the formerly homeless men's healthy lifestyle choices.

- Controlling food portion sizes (i.e., reducing calorie)
- Reducing intake of sugar sweetened beverages (SSB)
- Increasing regular physical activity (≥150 minutes per week)
- Reducing daily counts of cigarettes

VI. Goals

Short-Term Goals

- ↑ number of high-risk men enrolled in DPP
- Maintain the total number of attendees each week
- ↑ proportion of program participants who achieve their:
  - Physical activity goals
  - Dietary modification
- ↓ participants' daily cigarette use.

Long-Term Goals

- ↓ participants' mean weight
- ↑ program's sustainability
- Improve participants' health-related quality of life

Project Development Questions

- Is lifestyle modification such as eating healthy feasible in an extreme hardship condition?

- What impact will trained diabetes peer facilitators have on healthy lifestyle choices?

VII. Summary of Literature Synthesis

- Empowering people with adequate information will encourage them to make lifestyle changes.
- As facilitators' knowledge about diabetes prevention increases, they become more autonomous and develop more self-efficacy and confidence about their ability to help others.
- Peer facilitators can help to promote program relevance and motivate participants to engage in healthier behaviors.

VIII. Methodology

- Guided by application of the RE-AIM (Reach, Effectiveness, Adoption, Implementation and Maintenance) framework.
- Tailored, nurse-led, community-based program was a modified version of DPP-GLB.
- Five (5) men ("Peer Facilitators" – PFs) – Formerly homeless; partakers in residential, employment academy; previously certified to deliver the DPP-GLB curriculum; voluntarily committed to facilitate a 12-week DPP core intervention to three of their peers (n=15).
- Participants ("peers") and PFs were formerly homeless men with substantial risk factors for T2D.

Methodology (cont.)

- Participants ("peers") kept weekly logs of their daily intake of fruits/vegetables, grains, proteins and dairy products; minutes of daily physical activity; numbers of cigarettes smoked daily; and number of times per day that they replaced sugar sweetened beverages (SSB) with water.

- PFs weighed their peers, collected weekly data logs, calculated BMIs at weeks 1 and 12, and encouraged their peers.

- Nurse program leader (Doctor of Nursing Practice [DNP] student, DPP-GLB master trainer) provided weekly mentoring and guidance, and collected weekly logs from PFs.

IX. Results: Statistical Analyses & t-Tests

DIABETES RISK FACTORS	T1 = BASELINE Mean (SD) Median [IQR]	T2 = WEEK 4 Mean (SD) Median [IQR]	T3 = WEEK 8 Mean (SD) Median [IQR]	T4 = WEEK 12 Mean (SD) Median [IQR]	T2 – T1 (p-value)	T3 – T1 (p-value)	T4 – T1 (p-value)
WEIGHT	212.3 (79.6) 170 [94]	209.8 (77.4) 171 [94]	206.1 (74.7) 167 [92]	204.3 (75.0) 166 [48]	0.023	0.001	<0.001
BMI	30.8 (9.1) 26.6 [11.2]	-	-	29.7(8.6) 26.5 [10.7]	-	-	<0.001
PHYSICAL ACTIVITY	4.1 (2.6) 3 [5]	4.1 (2.3) 3 [4]	6.1 (1.4) 7 [2]	6.9 (0.5) 7 [0]	0.5	0.007	<0.001
CUT BACK* CIGARETTES	2.3 (2.8) 1 [5]	4.6 (0.0) 0 [5]	5.1 (2.3) 1 [5]	6.6 (0.9) 7 [0]	0.002	0.035	<0.001
REPLACED SUGAR SWEETENED BEVS W/ WATER	7.7 (5.9) 7 [12]	14.2 (6.8) 13 [3]	19.3 (4.9) 19 [8]	21.4 (2.3) 21 [4]	0.002	<0.001	<0.001
FRUIT/VEG	6.5 (4.3) 7 [7]	8.6 (4.9) 8 [9]	12.5 (5.4) 12 [9]	15.9 (4.0) 14 [8]	0.038	0.007	<0.001
GRAINS	8.4 (5.6) 7 [9]	14.7 (4.1) 14 [7]	16.7 (6.1) 18 [8]	18.0 (3.1) 18 [4]	0.001	<0.001	<0.001
PROTEINS	6.0 (4.4) 5 [6]	12.5 (5.8) 13 [5]	14.7 (4.7) 16 [5]	15.7 (4.9) 16 [4]	0.003	<0.001	<0.001
DAIRY	4.9 (4.2) 4 [6]	8.0 (6.5) 8 [12]	11.4 (7.2) 10 [12]	12.5 (4.7) 12 [6}	0.05	0.001	<0.001

Results: Statistical Analyses & t-Tests

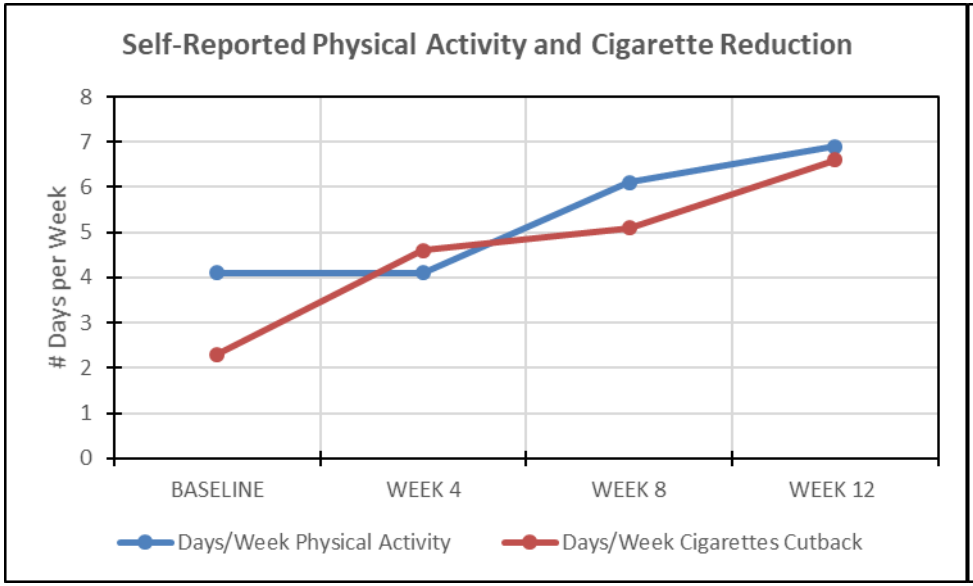

Figure 1. Self-reported weekly increases from baseline to week 12: Days per week with physical activity > 30 minutes (mean=4.1 vs. 6.9, *p <0.001)*; number of days per week that cigarette smoking was decreased (mean=2.3 vs. 6.6, *p<0.001*).

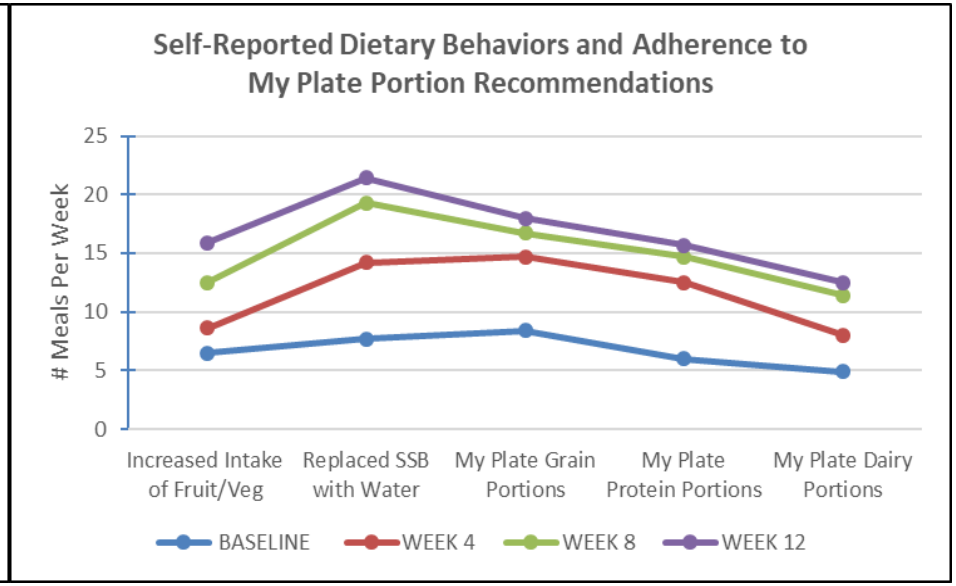

Figure 2. Number of meals per week from baseline to week 12 with increased fruit and vegetable intake (mean=6.5 vs.15.1; *p <0.001);* sugar-sweetened beverages replaced with water (mean=7.7 vs. 21.4; *p <0.001);* and adherence to My Plate recommendations about grain intake (mean = 8.4 vs. 18.0; *p <0.001);* protein intake (mean = 6.0 vs. 15.7; *p <0.001);* and dairy product intake (mean = 4.9 vs. 12.5; *p <0.001).*

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Results: Summary of Data Analyses

- **Physical Activity:** No significant change in mean # of days per week of physical activity between week 1 and week 4 (*p=0.5*). Significant ↑s in mean physical activity from weeks 1 to week 8 (*p=0.007*) and weeks 1 to week 12 (*p=<0.001*).
- **Smoking:** Significant ↑s in # of days per week that participants reported cutting back on cigarette smoking habits—baseline to week 4 (*p=0.002*), week 8 (*p=0.035*), and week 12 (*p<0.001*).
- **Fruits / Vegetables:** Significant ↑s in # of meals per week that participants ate at least half a plate of fruits/vegetables at each meal—baseline to week 4 (*p=0.038*), week 8 (*p=0.007*) and week 12 (*p<0.001*).
- **Food Intake:** Significant ↑s in # of meals per week that participants reported adhering to "My Plate" portion size recommendations for grain, protein, and dairy product intake—baseline ranges to weeks 4, 8 and 12 ranges (*p<0.001 to p=0.05*)
- **SSB:** Significant ↑s in # of meals per week that participants replaced SSBs with water—baseline to week 4 (*p=0.002*), week 8 (*p<0.001*) and week 12 (*p<0.001*).

Results: Unexpected Outcomes

- Total weight loss (n=15) over the 12-week intervention period = 120 pounds (range 1-24 pounds per person).

- Mean Weight Losses
  - Week 1 to 4 = 2.5 pounds (SD=4.5; *p<0.023*)
  - Week 1 to 8 = 6.2 pounds (SD=6.5; *p<0.001*)
  - Week 1 to 12 = 8.0 pounds (SD=6.0; *p<0.001*)

Results: Unexpected Outcomes

- High combined weight loss of 71 pounds was observed among six (6) men who were obese at baseline (mean weight loss=11.8lbs.; SD=7.0; *p=0.005*) (Tables 8, 10).

- Mean body mass index (BMI) ↓sed from week 1 (30.8 kg/m^2; SD=9.1) to week 12 (29.7 kg/m^2; SD=8.6)(*p=<0.001*).

- Six smokers (roughly 55%) contacted the state's Quitline for inclusion in smoking cessation programs and two of these six (33.33%) were using nicotine patches before the project ended.

X. Limitations

- Inability to make statistical inferences about relationships among variables secondary to small sample size
- Inability to verify self-reported measures except for weekly weights, which were measured by the PFs.
- Men's relative lack of control over food preparation and available dietary choices due to the residential program's heavy reliance on donated food.
- Competing concerns about employment and basic life needs.
- Participants and PFs only committed to a 12-week program instead of the typical 22-week of DPP interventions.
- Limited financial resources can impede progressions of scalable DPP.

XI. Benefits

- ↑ in PFs' work-enhancing opportunities
- ↑ in PFs' self-efficacity as they expressed interest in seeking employment as lay health workers.
- ↑ in PFs' ability to empower numerous others (i.e., often hard-to-reach individuals) in their network of family and friends.

XII. Conclusions & Sustainability

Self-reported adherences to recommended portion sizes in food intake combined with increases in physical activity might have:

- Contributed to improvements in participants' weights and BMIs

Partnerships with funders are necessary to:

- Foster employment opportunities
- Sustain and expand service capacity

XIII. References

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