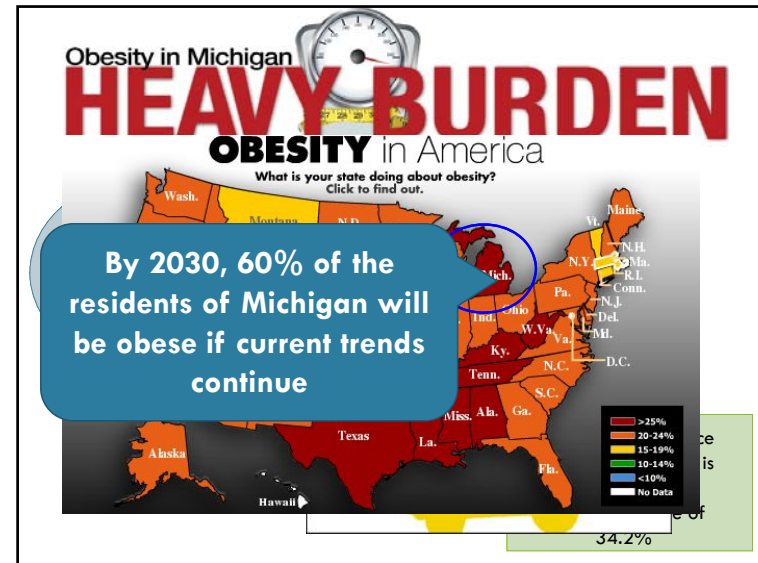


Effectiveness of Lifestyle Intervention Modalities in the Community: An Exploration of Intervention Modalities, Disparities, and the use of Peer Leaders in Primary Prevention

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Lifestyle Interventions for Patients with and at Risk for Diabetes

- Most current evidence from systematic review and meta-analysis:
 - 9 RCTs for patients at risk for diabetes
 - 11 RCT for patients with diabetes
 - 7 studies reported decreased risk for diabetes from the end of the intervention up to 10 years after it.
 - Comprehensive lifestyle intervention effectively decreases the incidence of type 2 diabetes in high-risk patients
 - No evidence of reduced all cause mortality and insufficient evidence to suggest benefit on CVD outcomes in those with type 2 diabetes

Schellenberg et al, *Annals of Internal Medicine*. 2013; 159:543-551

Objectives

- Describe the effectiveness of different modalities of lifestyle intervention in rural, underserved communities
- Describe the utility of using peer leaders as part of lifestyle intervention in rural, underserved communities

COMPARATIVE EFFECTIVENESS OF MULTIPLE MODALITIES OF LIFESTYLE INTERVENTION IN THE COMMUNITY: RESULTS OF THE *RETHINKING EATING AND ACTIVITY STUDY (REACT)*



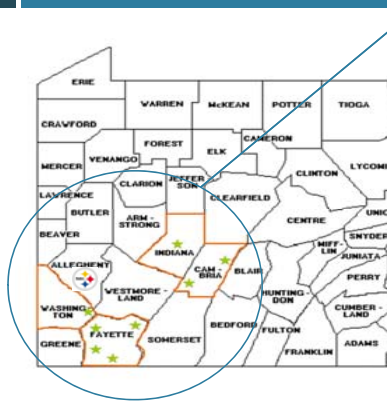
Objective

- To conduct a non-blinded, cluster designed, prospective intervention study, to determine the comparative effectiveness of **three** previously developed Group Lifestyle Balance (GLB) intervention modalities in **eight** underserved communities in southwestern Pennsylvania


Background

- **Comparative effectiveness**
 - Began with the American Recovery and Reinvestment Act (ARRA) of 2009
 - Core Question: Which treatment works best, for whom, and under what circumstances?
- Growing evidence exists that primary prevention interventions demonstrate the effectiveness of weight loss and risk reduction in community settings.
- Understanding the comparative effectiveness of **multiple modes of delivery (i.e. face to face, internet, DVD, etc)**, in community settings, is critical to meaningfully impact public health policy and clinical care.

Study Setting



- 8 underserved, rural communities near Pittsburgh
- Former steel town – victim of industrial downsizing and out-migration of youth with skills → more elderly with more chronic disease
- Local community hospitals/clinics served as bases in each community



Group Lifestyle Balance

- Comprehensive lifestyle behavior change program adapted directly from the lifestyle intervention used in the DPP
- Members from the original DPP lifestyle team collaborated to adapt and update the individual intervention to a group-based program
- Trained community nurses and dietitians to function as preventionists to facilitate the GLB intervention in each community

<http://www.diabetesprevention.pitt.edu/>



Outcomes

Primary

- **Waist Circumference**
- **Fasting Glucose**
 - Impaired fasting glucose “pre-diabetes” (fasting glucose 100 to 125 mg/dL)
- **5% weight loss**

Secondary

- **Hypertension** (BP \geq 130/85 mmHg)
- **Hyperlipidemia** (Triglycerides \geq 150 mg/dL)

Definitions based on NCEP ATP III

GLB Modalities

- **Face to Face GLB** – group education with weekly meetings for 12 weeks
- **DVD GLB** – 12 GLB sessions viewed via DVDs, with 4 in person meetings to debrief the DVDs
- **Internet GLB** – 12 GLB sessions incorporated into an online format with blogging and email capabilities
 - Developed specifically for the REACT study
- **Self Selection** – choice of one of the three above

Community Based Screenings and Recruitment (October 2009—June 2010)

- Screenings took place at **local hospitals, workplaces, universities, community centers, YMCAs, and fire halls**
- 44 screenings in 9 months
- 555 individuals screened for abdominal obesity and BMI \geq 25 kg/m²
- 493 individuals eligible
 - 434 enrolled = **88%** participation rate

By Modality:

- **Face to Face –98%**
- **DVD –86%**
- **Internet –83%**
- **Self Selection – 85%**
 - **40% chose Face to Face**
 - **60% chose Internet**
 - **0% chose DVD**

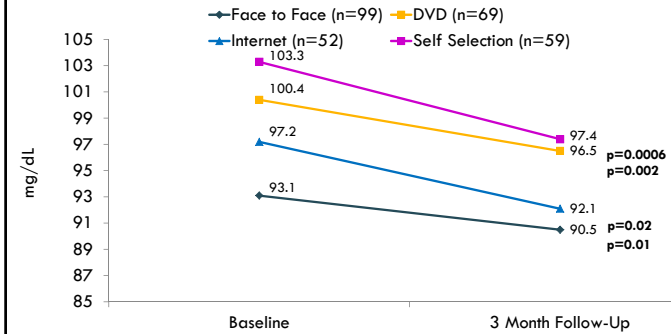


Baseline Characteristics of the Intervention Population by GLB Intervention Group (n=434)

Sociodemographic Parameters	Face to Face (n=119)	DVD (n=113)	Internet (n=101)	Self Selection (n=101)
Age (years)*	50.8 (11.3)	52.4 (10.9)	48.7 (9.8)	52.2 (12.6)
Gender (% female)**	87.6 (106)	85.0 (96)	88.4 (91)	82.4 (84)
Race (% Caucasian)**	100.0 (121)	93.8 (106)	97.1 (100)	96.1 (98)
Smoke (% ever smoke)**	32.5 (39)	38.4 (43)	40.8 (42)	32.7 (33)
Education Level (% > high school diploma)**	65.3 (79)	77.9 (88)	81.6 (84)	77.5 (79)
Poverty (% with income < \$20,000/year)**	7.4 (9)	8.9 (10)	5.8 (6)	11.8 (12)
Family history of diabetes (% yes)**	63.3 (74)	68.6 (70)	69.8 (67)	63.6 (63)

*Data are mean **Data are percent
No significant differences in any parameter between groups

Change in Fasting Glucose by Group (Baseline-3 Month Follow-Up)



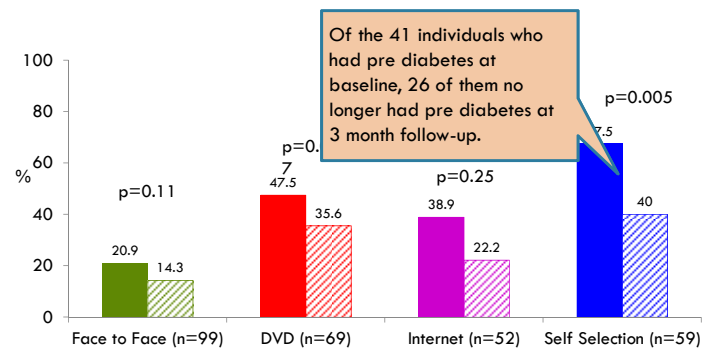
Multivariate results (effect of group): p=0.68
(Effect of group is adjusted for the clustering of individuals within community, age, gender, smoking, and baseline glucose)

Baseline Characteristics of the Intervention Population by GLB Intervention Group (n=434) Cont'd

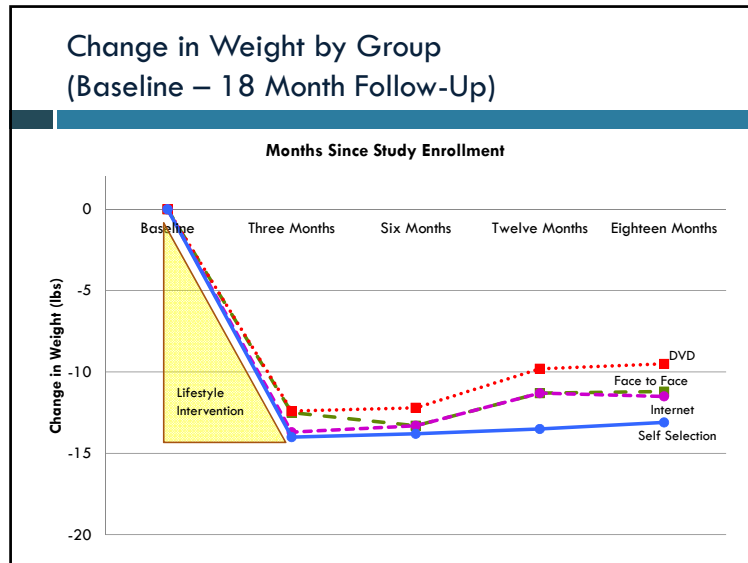
Anthropometric and Clinical Parameters	Face to Face (n=119)	DVD (n=113)	Internet (n=101)	Self Selection (n=101)
BMI (kg/m ²)*	37.0 (6.9)	36.2 (7.2)	36.1 (6.4)	34.9 (5.7)
Weight (lbs)*	217.3 (42.2)	217.3 (47.4)	219.2 (43.8)	205.9 (49.0)
Obese (BMI ≥ 30 kg/m ²)**	89.3 (108)	84.1 (95)	86.4 (89)	84.3 (86)
Morbidly obese (BMI ≥ 40 g/m ²)**	30.6 (37)	20.4 (23)	32 (33)	20.6 (21)
Waist circumference (inches)*	44.2 (5.9)	44.7 (6.7)	41.4 (7.5)	46.6 (22.5)
Glucose (mg/dL)*	93.9 (10.8)	100.8 (12.7)	97.5 (15.2)	101.4 (11.6)
Triglycerides (mg/dL)*	138.6 (76.8)	136.2 (64.5)	112.7 (60.9)	123.4 (52.8)
HDLc (mg/dL)*	45.6 (11.6)	45.4 (10.7)	50.1 (15.5)	51.3 (12.5)
Systolic Blood Pressure (mmHg)*	127.4 (11.3)	125.9 (13.4)	125.7 (12.2)	131.3 (13.6)
Diastolic Blood Pressure (mmHg)*	79.4 (6.9)	78.0 (9.0)	77.6 (10.4)	77.5 (8.7)

*Data are mean **Data are percent
Yellow indicates significant differences between groups

Change in the Proportion of Individuals with Impaired Fasting Glucose (Pre-Diabetes) by Group (Baseline-3 Month Follow-Up)

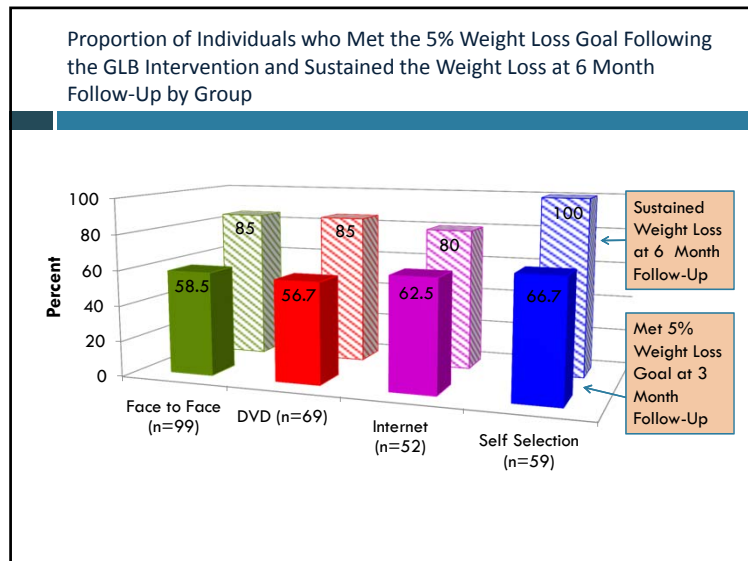


Multivariate results (effect of group): p=0.37
(Effect of group is adjusted for age, gender, smoking, and baseline IFG)



Summary

- Regardless of the modality, the GLB intervention was effective at improving glucose, waist circumference, weight loss, and other diabetes-related risk factors.
- However, **self selection** participants, who were empowered to choose their GLB modality, experienced greater improvements in IFG and weight loss compared to other groups
 - 100% of **self selection** participants maintained their weight loss at 6 month follow-up
- The importance of personalized attention and patient-centered decision making in healthcare is paramount.



IMPROVED FUNCTIONING AND WELL BEING

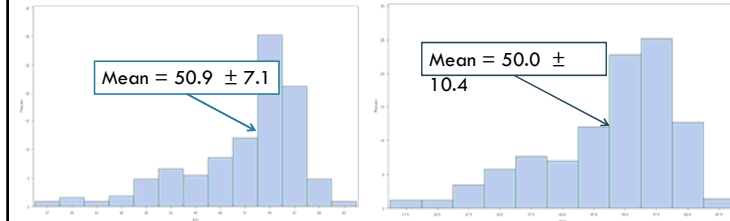
Objective

- To determine if **three** Group Lifestyle Balance (GLB) intervention modalities were effective in improving functioning and well being in overweight individuals from **eight** rural communities in southwestern, Pennsylvania.

Baseline Physical and Mental Functioning Scores (n=434)

Physical Functioning (PCS)

Mental Functioning (MCS)

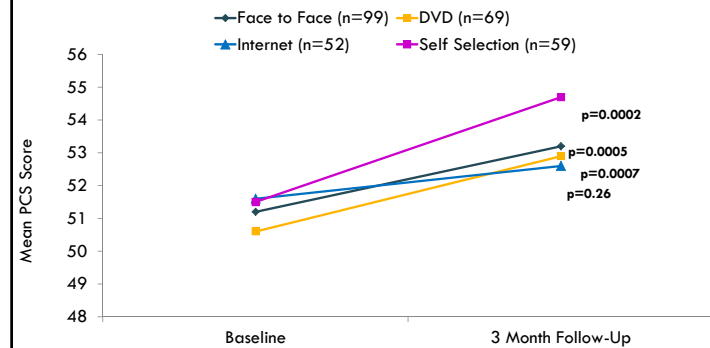


No differences by study group

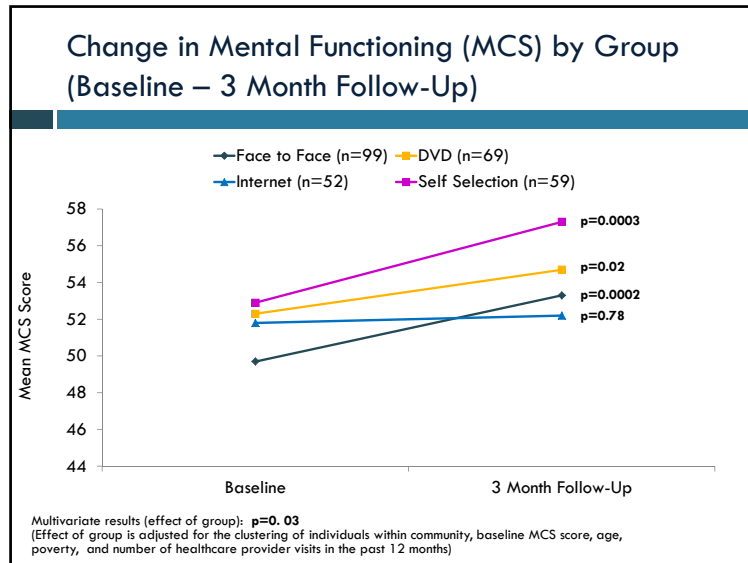
Outcomes

- Medical Outcome Study 12-item Short form (SF-12)
 - Multipurpose short form with 12 questions all from the SF-36
 - Scores range from 0 – 100 where zero indicates the lowest level of health and 100 indicates the highest level of health.
 - Composed of :
 - **Physical Composite Score (PCS-12)** – self reported physical functioning
 - **Mental Composite Score (MCS-12)** – self reported emotional well-being
 - National norm mean score of 50 with standard deviation of 10.
 - Largely influenced by age.

Change in Physical Functioning (PCS) by Group (Baseline – 3 Month Follow-Up)



Multivariate results (effect of group): $p=0.02$
 (Effect of group is adjusted for the clustering of individuals within community, baseline PCS score, age, poverty, and number of healthcare provider visits in the past 12 months)



COMMUNITY-BASED PEER SUPPORT IN ACHIEVING AND MAINTAINING WEIGHT LOSS

- ### Summary
- The Group Lifestyle Balance program is effective at improving physical and mental functioning when delivered through **face to face and DVD modalities**, but not through the **internet**.
 - The largest improvements were observed when individuals were given the opportunity to choose their Group Lifestyle Balance modality.
 - This concept supports empowerment, which prioritizes patient choices to achieve personal goals.

- ### Are Peer Support Models the Answer?
- 4 Key functions of a peer leader:
 1. Assisting in self management
 2. Emotional and social support
 3. Linkage to clinical care
 4. Ongoing support
 - Peer support helps to:
 - ↓ problematic health behaviors
 - ↓ depression
 - ↑ diabetes management behaviors
 - Peers may effectively and economically fill the need for patient **support** in maintaining lifestyle changes
-
- Funnell, Family Practice, 2009; Heisler, Diabetes Spectrum, 2007; Peers for Progress, 2008
-

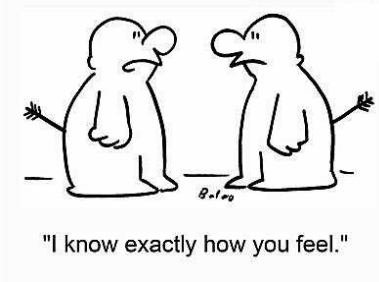
Objective

- To determine the effectiveness of a peer-based support model in achieving and maintaining weight loss following a lifestyle intervention in 8 rural communities in southwestern, Pennsylvania.



Who were our Peer Leaders?

- Lived and/or worked in the study communities
- Did not have to have pre diabetes or diabetes
- Interested in helping people
- Employees of community hospitals
- Compensated for their time
- Empathetic



Peer Support Models

Community-Based Peer Support Model (n=96 patients)

- Support in the context of the community, not within a healthcare organization
- Lived and worked in the study communities

Hospital/Clinic-Based Peer Support Model (n=288 patients)

- Support provided in a community-based healthcare organization
- Worked in the study communities but did not necessarily live there

Peer Leader Training

- Content of the GLB curriculum
- Active listening
- Research fundamentals
- HIPAA



Baseline Characteristics of the Intervention Population by Type of Peer Support (n=434)

Sociodemographic Parameters	Community-Based Peer Support	Hospital/Clinic-Based Peer Support	P value
Age (years)*	52.6 (12.0)	51.4 (10.7)	0.36
Gender (% female)**	82.3 (79)	97.5 (252)	0.2
Race (% Caucasian)**	95.8 (92)	96.5 (278)	0.75
Smoke (% ever smoke)**	34.7 (33)	35.7 (102)	0.87
Education Level (% > high school diploma)**	44.8 (43)	29.9 (86)	0.007
Poverty (% with income < \$20,000/year)**	5.2 (5)	8.0 (23)	0.36
Family history of diabetes (% yes)**	65.2 (60)	67.3 (181)	0.72

*Data are mean **Data are percent



Baseline Characteristics of the Intervention Population by Type of Peer Support (n=434)

Anthropometric and Clinical Parameters	Community-Based Peer Support	Hospital-Based Peer Support	P value
BMI (kg/m ²)*	34.6 (5.4)	36.8 (7.1)	0.001
Weight (lbs)*	207.9 (35)	217.4 (47.3)	0.04
Obese (BMI ≥ 30 kg/m ²)**	82.3 (79)	86.5 (249)	0.32
Morbidly obese (BMI ≥ 40 g/m ²)**	16.7 (16)	28.8 (83)	0.02
Waist circumference (inches)*	43 (4.8)	44.5 (6.2)	0.02
Glucose (mg/dL)*	99.8 (11.5)	97.5 (13.3)	0.13
Triglycerides (mg/dL)*	122.2 (56)	130.7 (68.8)	0.23
HDLc (mg/dL)*	49.6 (12.3)	47 (12.6)	0.07
Systolic Blood Pressure (mmHg)*	130.2 (13.9)	126.6 (12)	0.02
Diastolic Blood Pressure (mmHg)*	78.2 (8.7)	78.3 (8.7)	0.93

*Data are mean **Data are percent

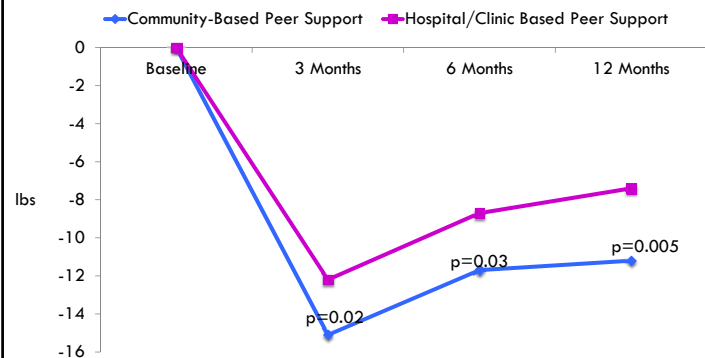


Multivariate Analyses of Associations with Weight Loss at 12 Month Follow-Up

	β	95% CI	P-value
Baseline Weight (lbs)	0.06	(0.02, 0.1)	0.002
Age (years)	0.01	(-0.14, 0.17)	0.87
Type of Peer Support (Community-based: Hospital-based)	4.5	(0.12, 8.9)	0.05
Mental Component of SF-12	0.1	(-0.07, 0.27)	0.25
Exercise	3.7	(-3.1, 10.3)	0.28
Study Group	0.43	(-1.3, 2.1)	0.62

Participants with community-based peer leaders were 4.5x more likely to achieve statistically significant weight loss at 12 month follow-up compared to participants who had hospital-based peer leaders

Average Weight Loss by Type of Peer Support



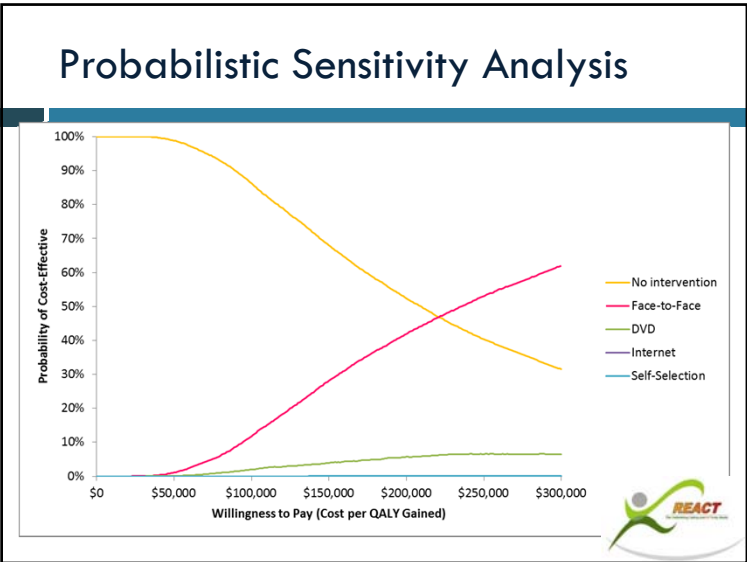
Multivariate results (effect of group): **p=0.6**
 Effect of group is adjusted for the clustering of individuals within community, baseline weight, age, mental functioning component of SF-12, and number of days of physical activity in the past 3 months

Summary

- Despite the lifestyle modality, participants who received **community-based peer support** achieved and maintained significantly greater weight loss compared to participants who received **hospital/clinic-based peer support**.
- As programs that include peer leaders are implemented worldwide, increased attention should be placed on the importance of the peer leader within the context of the community, not just the health system.




COST EFFECTIVENESS OF MULTIPLE MODALITIES OF LIFESTYLE INTERVENTION IN THE COMMUNITY

Objective

To assess the cost-effectiveness of the four strategies – which are based on three GLB modalities (Face-to-Face, DVD, and Internet) and a Self-Selection strategy – relative to each other and also to a “no intervention” (no GLB) strategy



Conclusions

The Face-to-Face GLB strategy delivered in the rural communities is a sound investment among three GLB modalities, and appears to be an economically reasonable compared with the no GLB strategy.

