



# ***SAMHSA-HRSA Center for Integrated Health Solutions***

## **Reversing Early Mortality Due To Obesity and Cardiovascular Risk Factors In Mental Illness:**

### ***What Works In Changing Health Behaviors?***

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# Disclosures

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- NIMH
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- HRSA
- Endowment for Health
- Bosch Healthcare
- CMS

## Consultant:

- Substance Abuse and Mental Health Services Administration
- National Association of State Mental Health Program Directors



## Overview

- Obesity risk factors and cardiovascular mortality
- Findings from the research literature physical activity and weight loss interventions for persons with mental illness
- What is more (and less) likely to work
- Recommendations



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# Poll Questions



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## ***The Bottom Line***

- *Both* obesity and poor fitness are killers
- Changing health behaviors is HARD work but essential to improving health and life expectancy
- The best studies demonstrate modest results in reducing obesity but better results in improving fitness
- What works better? Intensive manualized programs that combine coached physical activity and dietary change lasting at least 6 months (or more)
- Clinically significant weight loss is likely to be achieved by some, but improved fitness by more.....and both are important for heart health



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**HOW WE GOT HERE.....**



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## An “Epidemic” of Early Mortality: Mean Years of Potential Life Lost

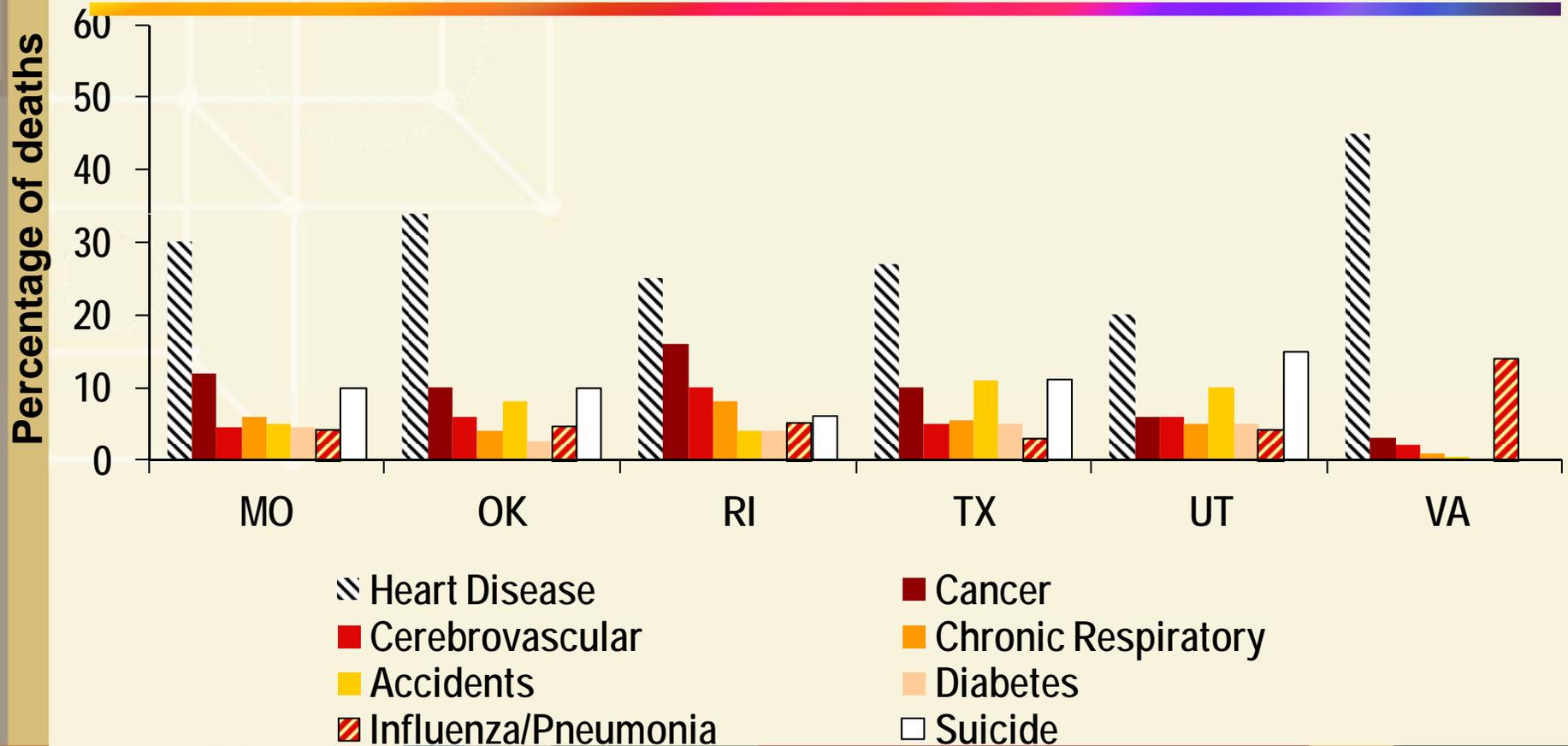
Year	AZ	MO	OK	RI	TX	UT
1997		26.3	25.1		28.5	
1998		27.3	25.1		28.8	29.3
1999	32.2	26.8	26.3		29.3	26.9
2000	31.8	27.9		24.9		

Compared with the general population, persons with major mental illness lose 25-30 years of normal life span

Colton CW, Manderscheid RW. Prev Chronic Dis [serial online] 2006 Apr [date cited].  
Available at: [http://www.cdc.gov/pcd/issues/2006/apr/05\\_0180.htm](http://www.cdc.gov/pcd/issues/2006/apr/05_0180.htm)

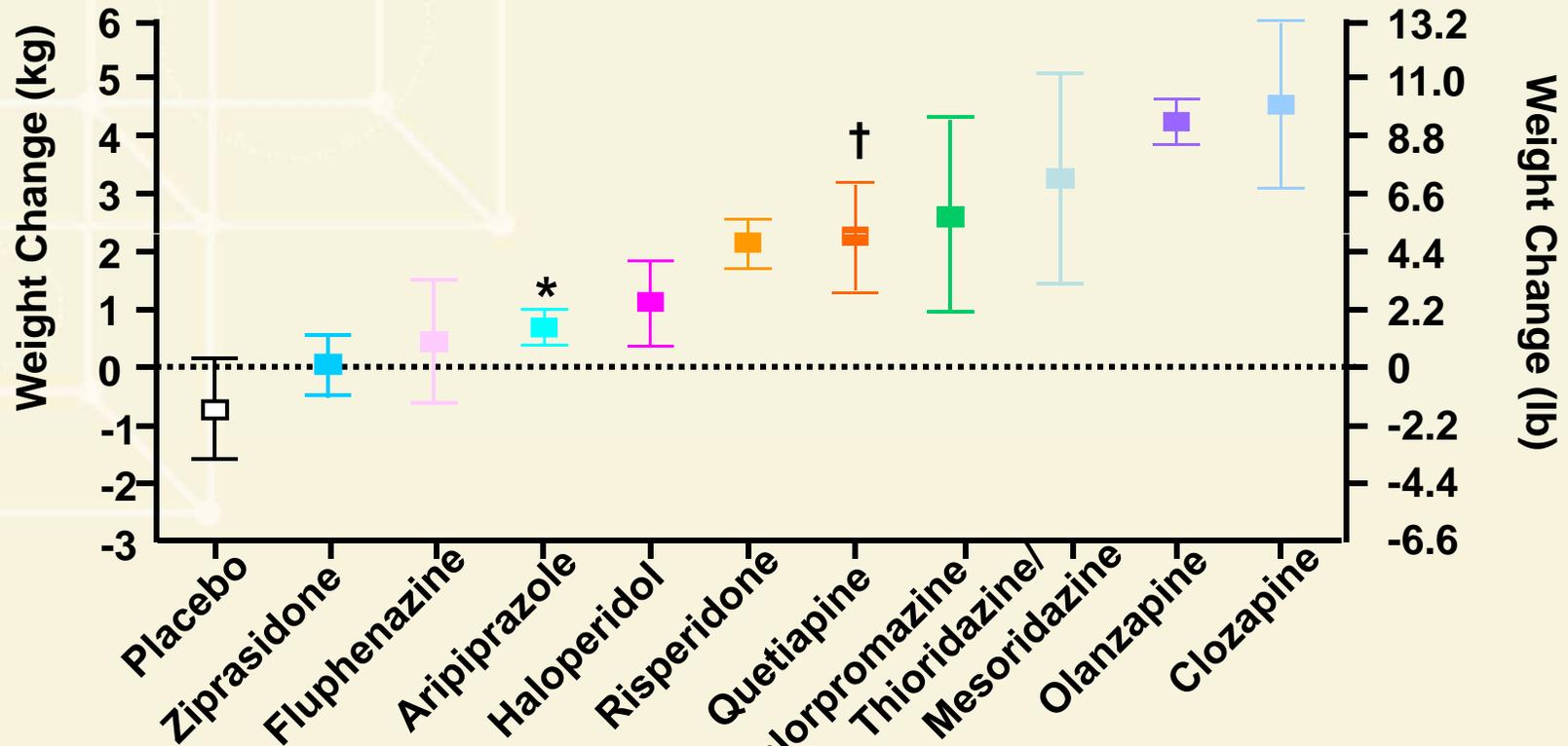


# Cardiovascular Disease Is Primary Cause of Death in Persons with Mental Illness\*



# Mean Change in Weight With Antipsychotics

Estimated Weight Change at 10 Weeks on "Standard" Dose



\*4-6 week pooled data (Marder SR et al. *Schizophr Res.* 2003;1:61:123-36; †6-week data adapted from Allison DB, Mentore JL, Heo M, et al. *Am J Psychiatry.* 1999;156:1686-1696; Jones AM et al. *ACNP*; 1999.



# Determinants of Health

- What Factors Account for Health?
- What Factors Account for Premature Mortality?
- How Much is Due to Health Care?
- How Much is Due to Other Factors
  - Genetics, Socioeconomic Factors, Environment, Health Behaviors, etc.



# Selected Risk Factors Attributable to Premature Mortality Worldwide

<b>Attributable Risk Factor</b>	<b>% of Annual Deaths</b>
<b>High blood pressure</b>	<b>12.8%</b>
<b>Tobacco use</b>	<b>8.7%</b>
<b>High blood glucose</b>	<b>5.8%</b>
<b>Physical inactivity</b>	<b>5.5%</b>
<b>Overweight &amp; obesity</b>	<b>4.8%</b>
<b>High cholesterol</b>	<b>4.5%</b>
<b>Total</b>	<b>42.1%</b>



# Cardiovascular Disease (CVD) Risk Factors

Modifiable Risk Factors	Estimated Prevalence and Relative Risk (RR)	
	Schizophrenia	Bipolar Disorder
Obesity	45–55%, 1.5-2X RR <sup>1</sup>	26% <sup>5</sup>
Smoking	50–80%, 2-3X RR <sup>2</sup>	55% <sup>6</sup>
Diabetes	10–14%, 2X RR <sup>3</sup>	10% <sup>7</sup>
Hypertension	≥18% <sup>4</sup>	15% <sup>5</sup>
Dyslipidemia	Up to 5X RR <sup>8</sup>	

1. Davidson S, et al. *Aust N Z J Psychiatry*. 2001;35:196-202. 2. Allison DB, et al. *J Clin Psychiatry*. 1999; 60:215-220.  
 3. Dixon L, et al. *J Nerv Ment Dis*. 1999;187:496-502. 4. Herran A, et al. *Schizophr Res*. 2000;41:373-381.  
 5. MeElroy SL, et al. *J Clin Psychiatry*. 2002;63:207-213. 6. Ucoc A, et al. *Psychiatry Clin Neurosci*. 2004;58:434-437.  
 7. Cassidy F, et al. *Am J Psychiatry*. 1999;156:1417-1420. 8. Allebeck. *Schizophr Bull*. 1999;15(1)81-89.

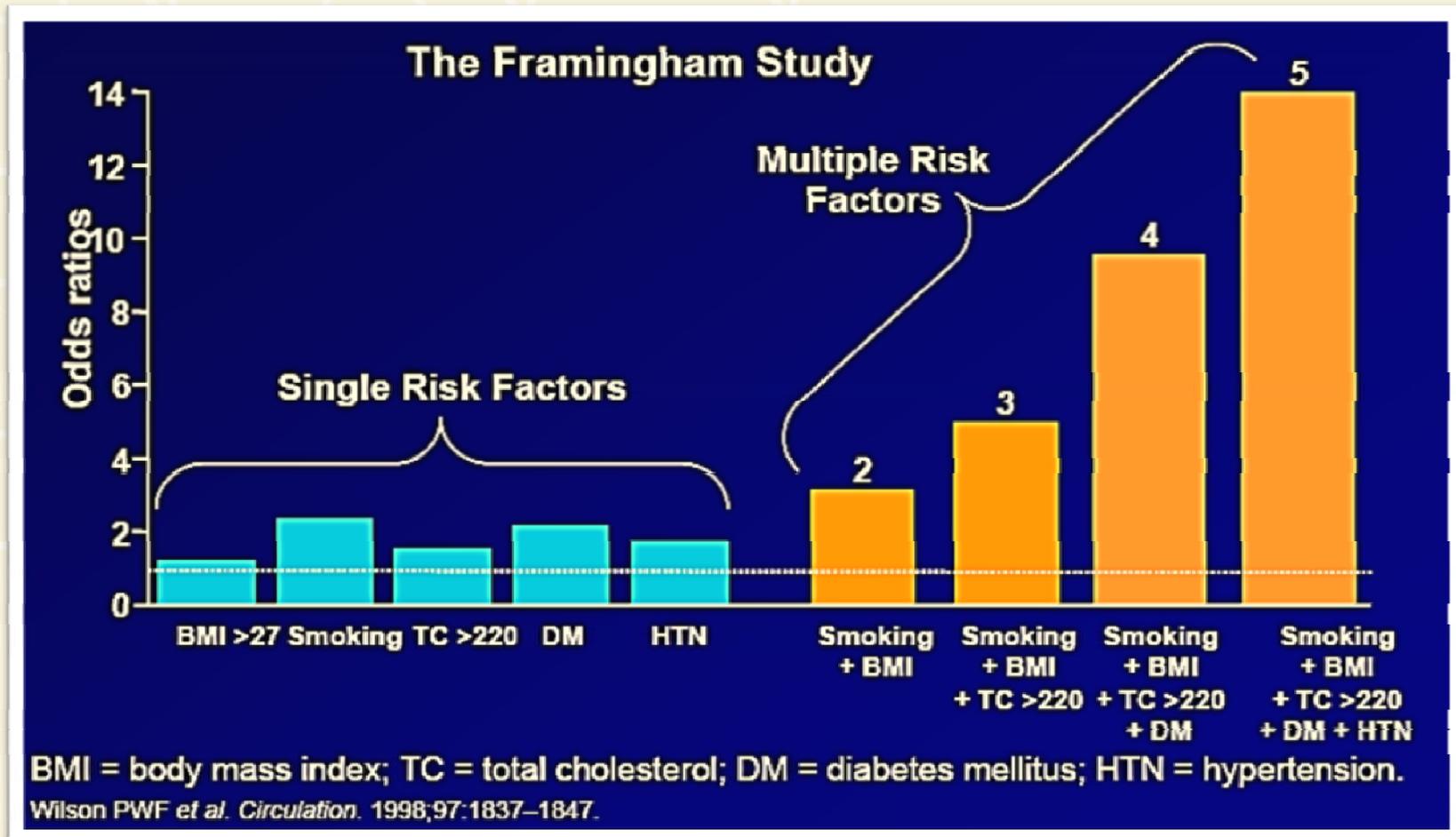


## **Obesity Risk Factors for Persons with SMI**

- Obesity: > **42%** (vs. 28% gen pop)
- **3-6X** greater risk of metabolic syndrome
- Regular Moderate Exercise < 20%
- Compared to the general population:
  - Fewer fruits and vegetables
  - More calories and saturated fats

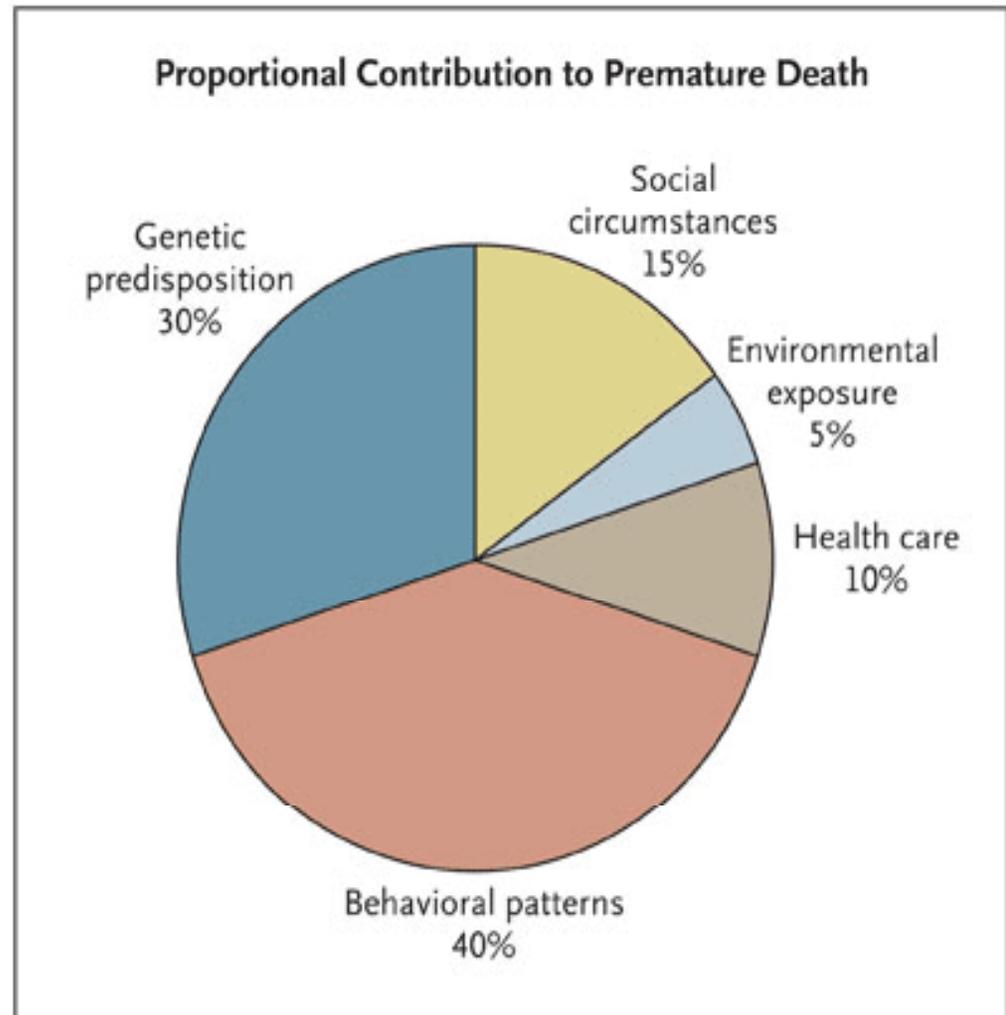


# Cardiovascular Risk Factors Add UP! The “Perfect Storm”



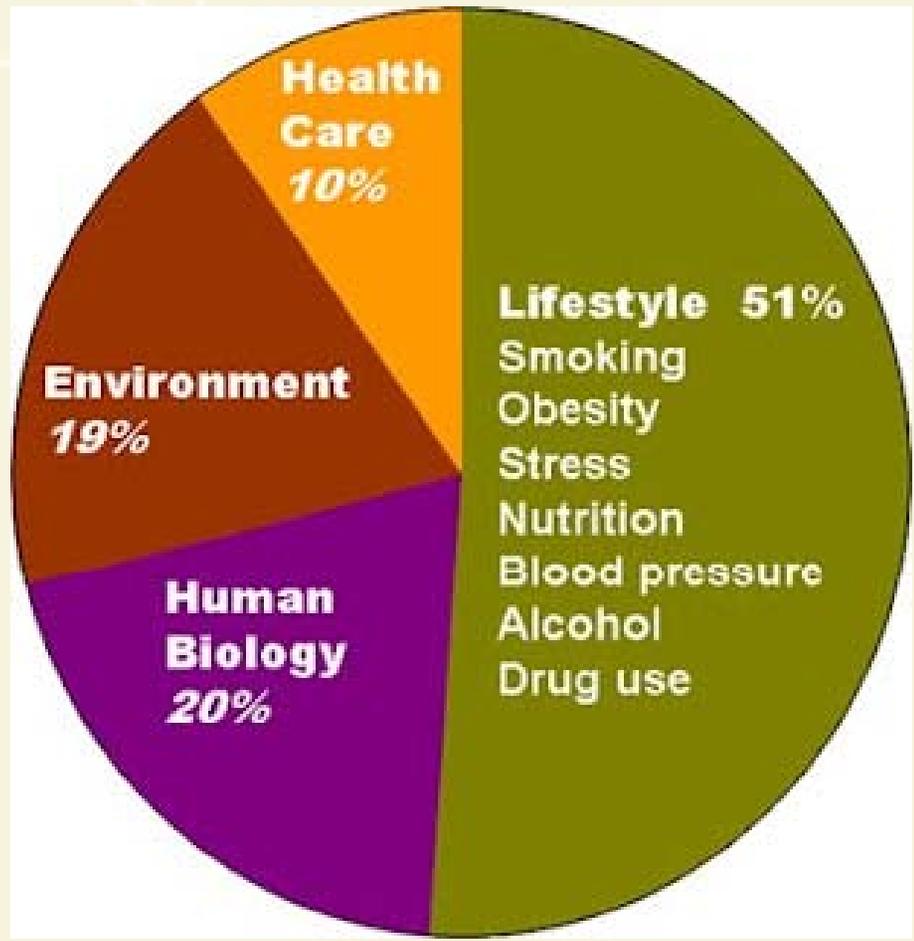
# Factors Affecting Premature Death in the Population:

*Health Behaviors*  
**4X** Health Care



# Determinants Of Health (World Health Organization)

Lifestyle **5X**  
Health Care



# The Good News: Reducing Risks of Cardiovascular Disease

- Maintenance of ideal body weight (BMI = 18.5-25)
  - 35%-55% ↓ in CVD
- Maintenance of active lifestyle (~30-min walk daily)
  - 35%-55% ↓ in CVD
- Cigarette smoking cessation
  - ~ 50% ↓ in CVD

Hennekens CH. *Circulation* 1998;97:1095-1102.  
Rich-Edwards JW, et al. *N Engl J Med* 1995;332:1758-1766.  
Bassuk SS, Manson JE. *J Appl Physiol* 2005;99:1193-1204.

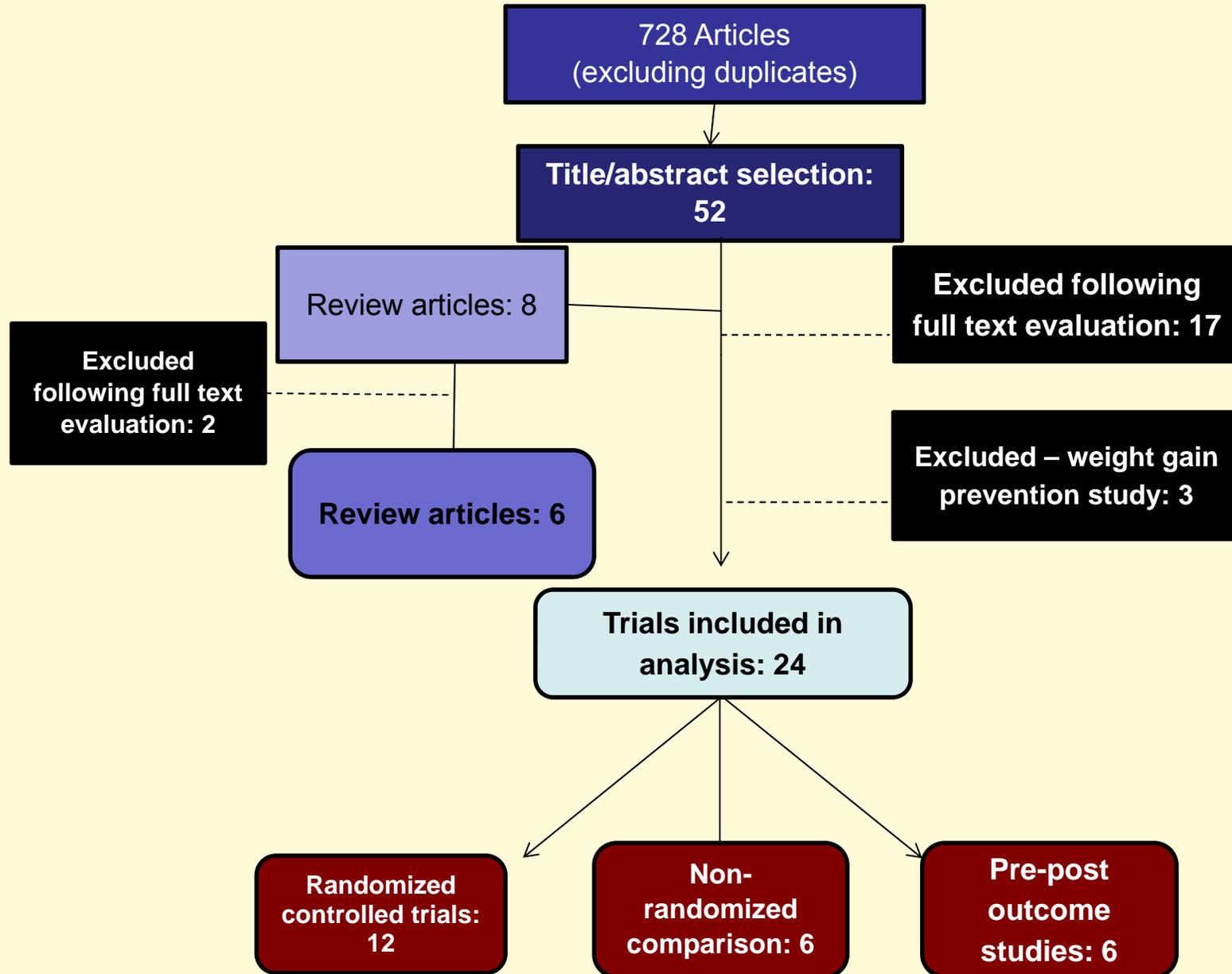


# What is the Effectiveness of Health Promotion Programs for Persons with Serious Mental Illness?

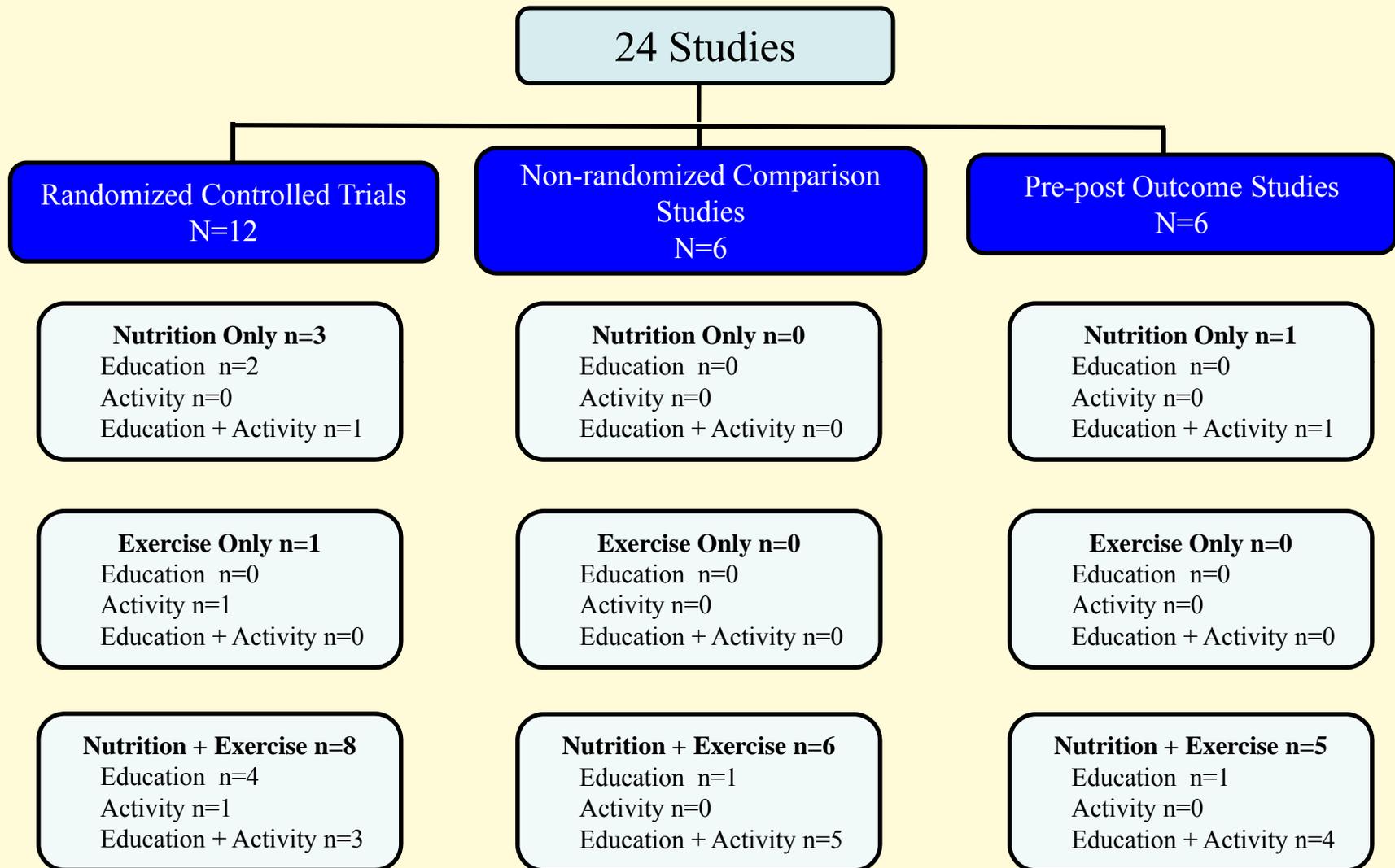
*What works more?*  
*What works less?*



# Systematic Review: Behavioral Interventions



# Health Promotion and Serious Mental Illness



## Results

- 12 RCTs: Median weight loss: 5.5 lbs
- 18 Controlled Comparison Studies:
  - 55% (10/18) statistically significant weight loss
  - Median % weight loss: 2.6%
  - NONE of the community-based trials achieved clinically significant (5%) weight loss
  - One study 38% of participants > 5% weight loss



## Characteristics of Studies with Significant Positive Findings (n = 16)

Main Component	Education	Activity	Education + Activity	TOTAL
Nutrition	1	0	2	3
<b>Nutrition + Exercise</b>	4	1	<b><u>8</u></b>	13
<b>TOTAL</b>	5	1	10	16



# Characteristics of Studies with Statistically Significant Results

- Duration  $\geq$  24 weeks
- BOTH Education and Activity
- BOTH Diet & Exercise
- Manualized & intensive programs
- Ongoing Measurement and Feedback of Success (e.g., Monitoring Physical Activity, Nutrition Change, Weekly Weights)



## Limitations.....

- To date, clinically significant mean weight loss (>5%) has been elusive.....
- Studies generally limited to
- brief duration (3-6 months)
- Small study samples
- Few well-designed RCTs





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## **BREAK: Question & Discussion What Do We Know About What Works?**



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# IN SHAPE Health Promotion Program

- Individualized fitness and healthy lifestyle assessment
- Individual Meetings with a “Health Mentor”
- Membership Vouchers to Local Fitness Centers
- Group Health Education/Motivational “Celebrations”
- Nurse Evaluation and Consultation

*Promoting Health and Functioning in Persons with SMI: CDC - R01 DD000140 (PI: Bartels)*

*Health Promotion and Fitness for Younger and Older Adults With SMI: R01 MH078052-01 (PI: Bartels)*



# The In SHAPE Health Promotion Intervention

- Participants spend time each week with personal mentors working out, taking walks, in classes or working on nutrition plans.
- Mentors help participants to track their progress, set goals, and stay motivated.

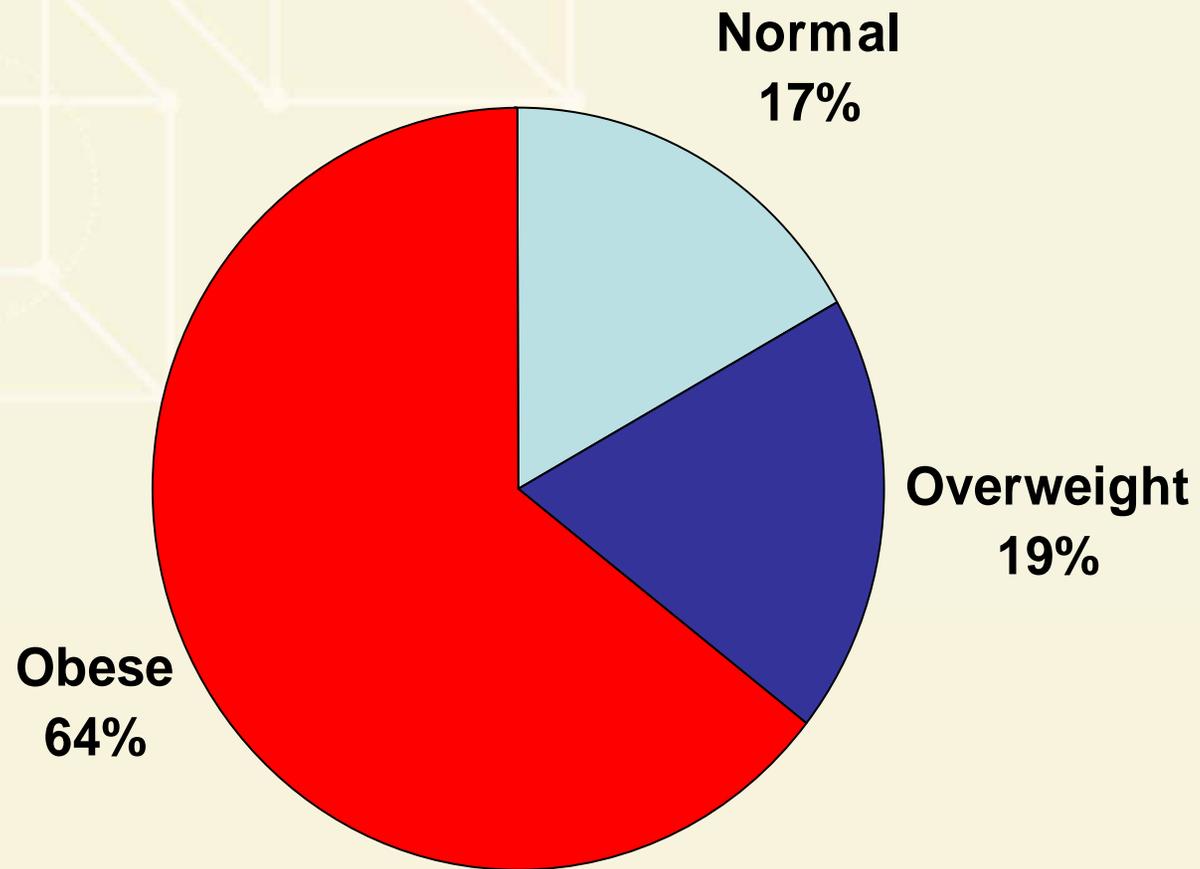




## The In SHAPE Health Mentor Program



# Body Mass Index



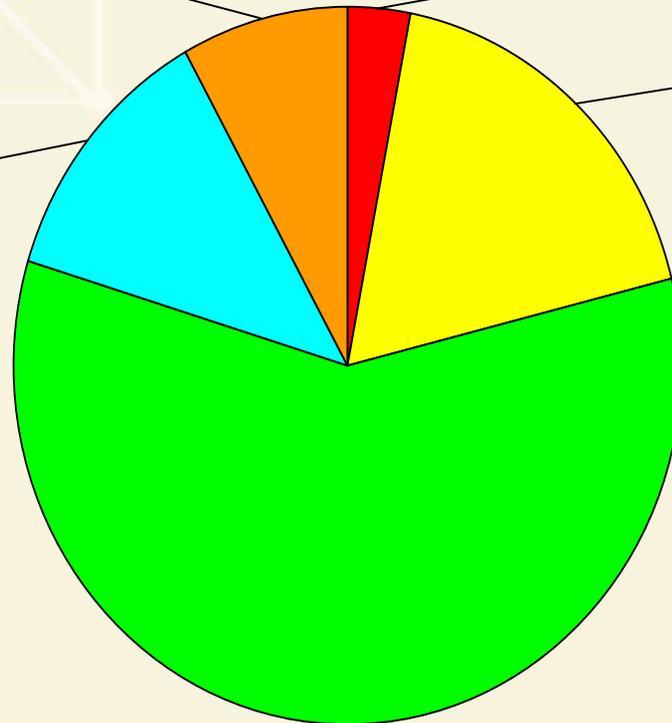
Average weight = 204 pounds



# Do you Exercise Regularly?

**Exercising > 6 months**  
8%

**Exercising < 6 months**  
12%

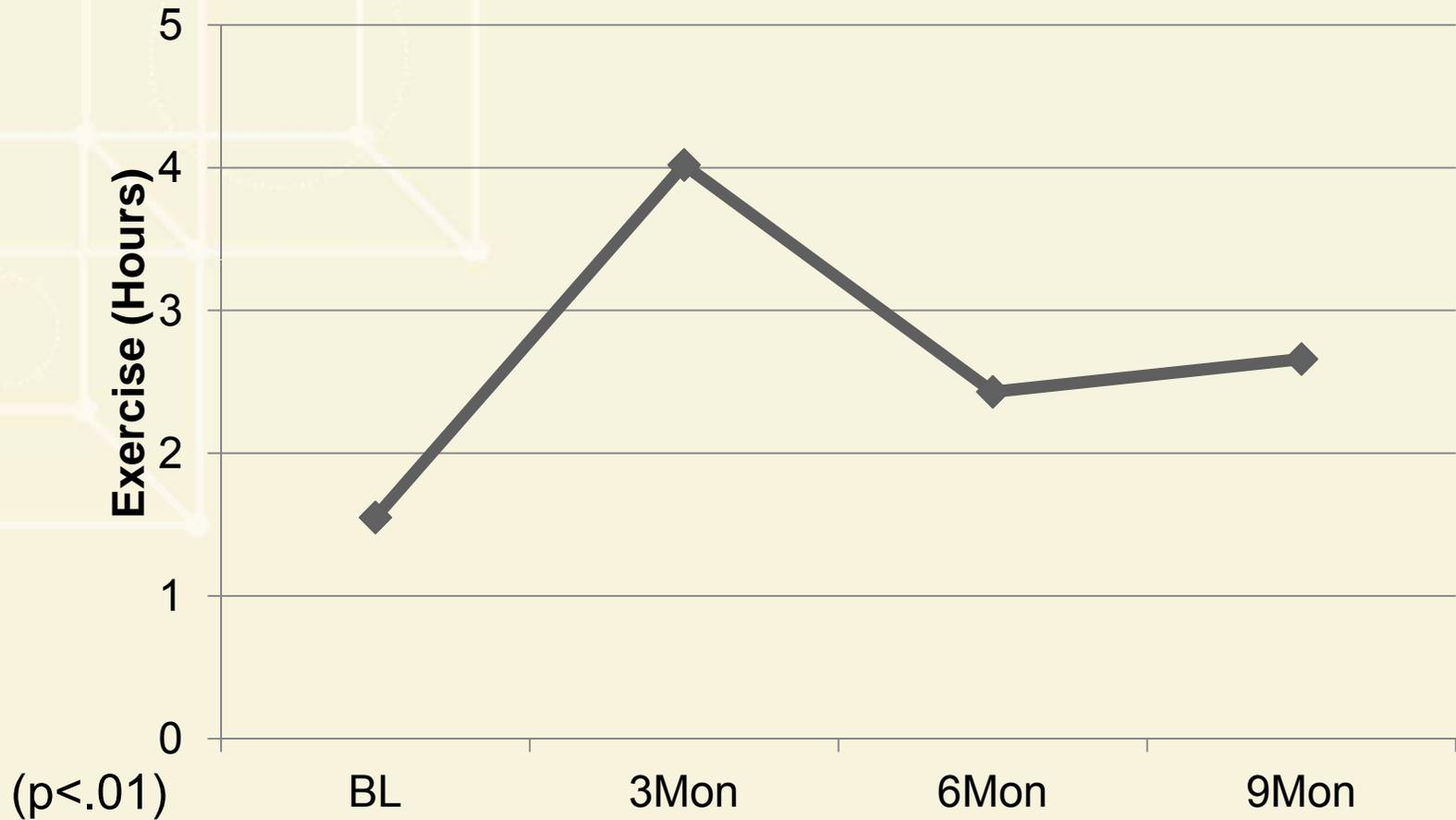


**Pre-contemplation**  
Thinking about it  
3%

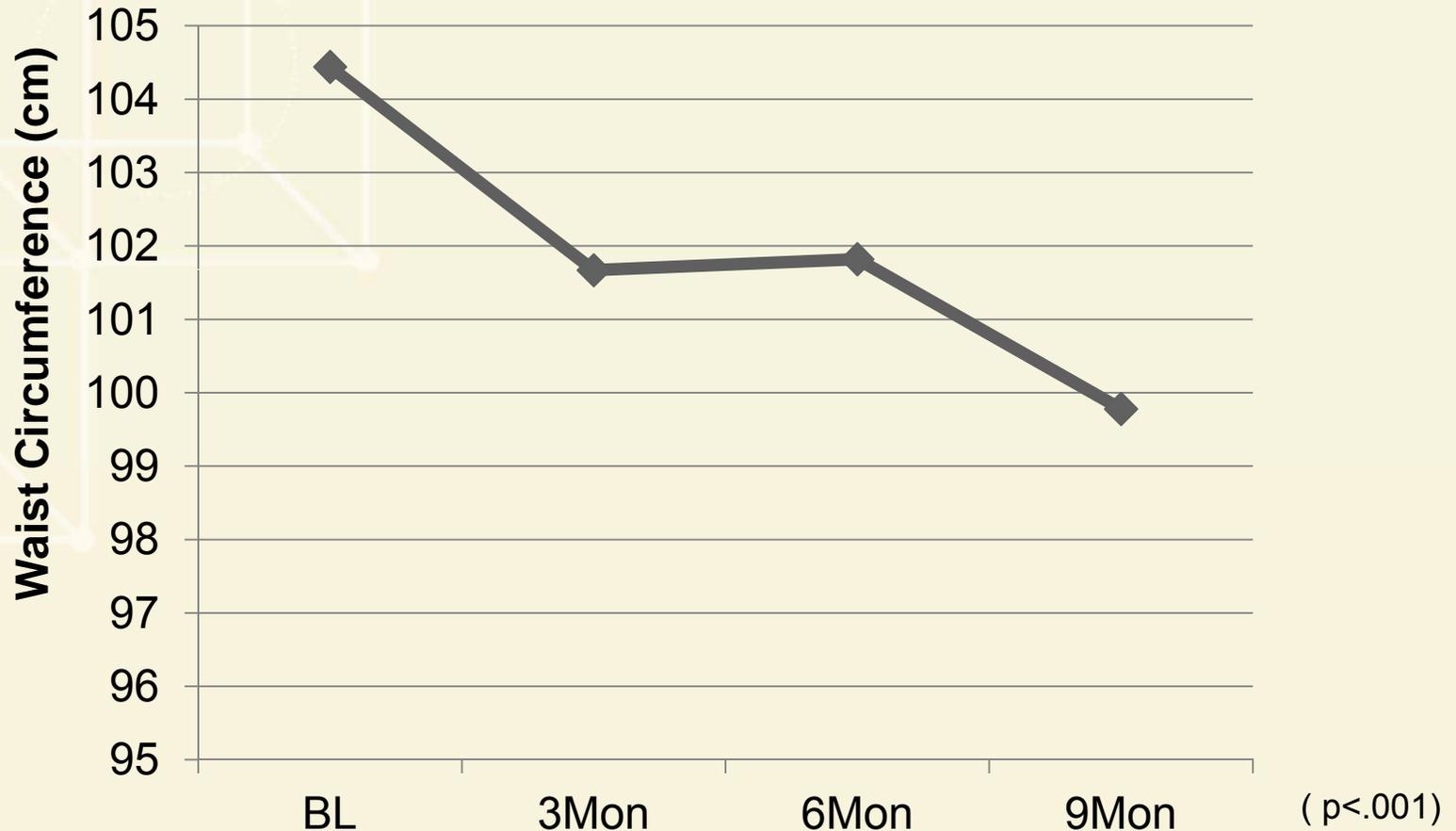
**Planning to do it**  
59%



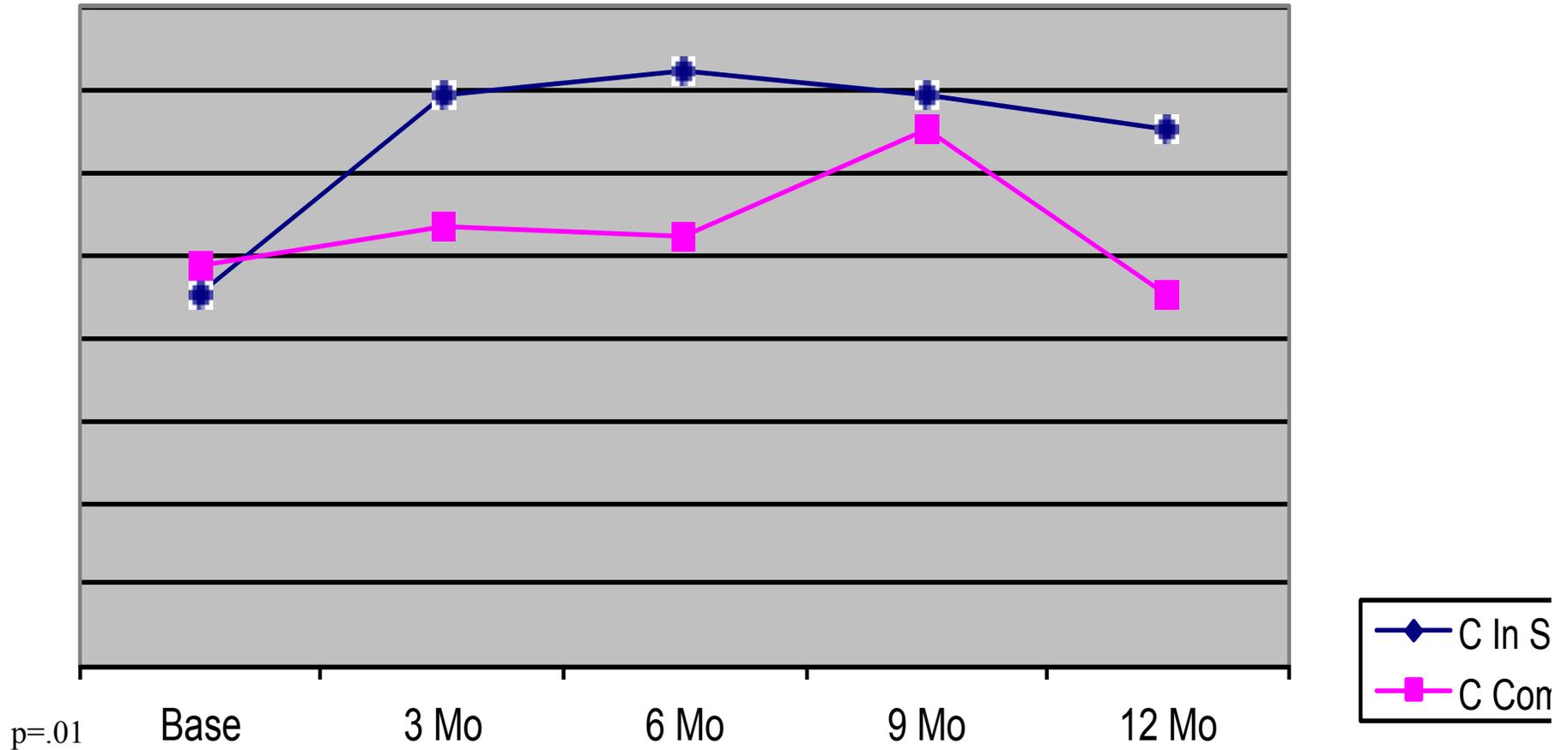
# In SHAPE Pilot Study: Hours of Exercise (n=76)



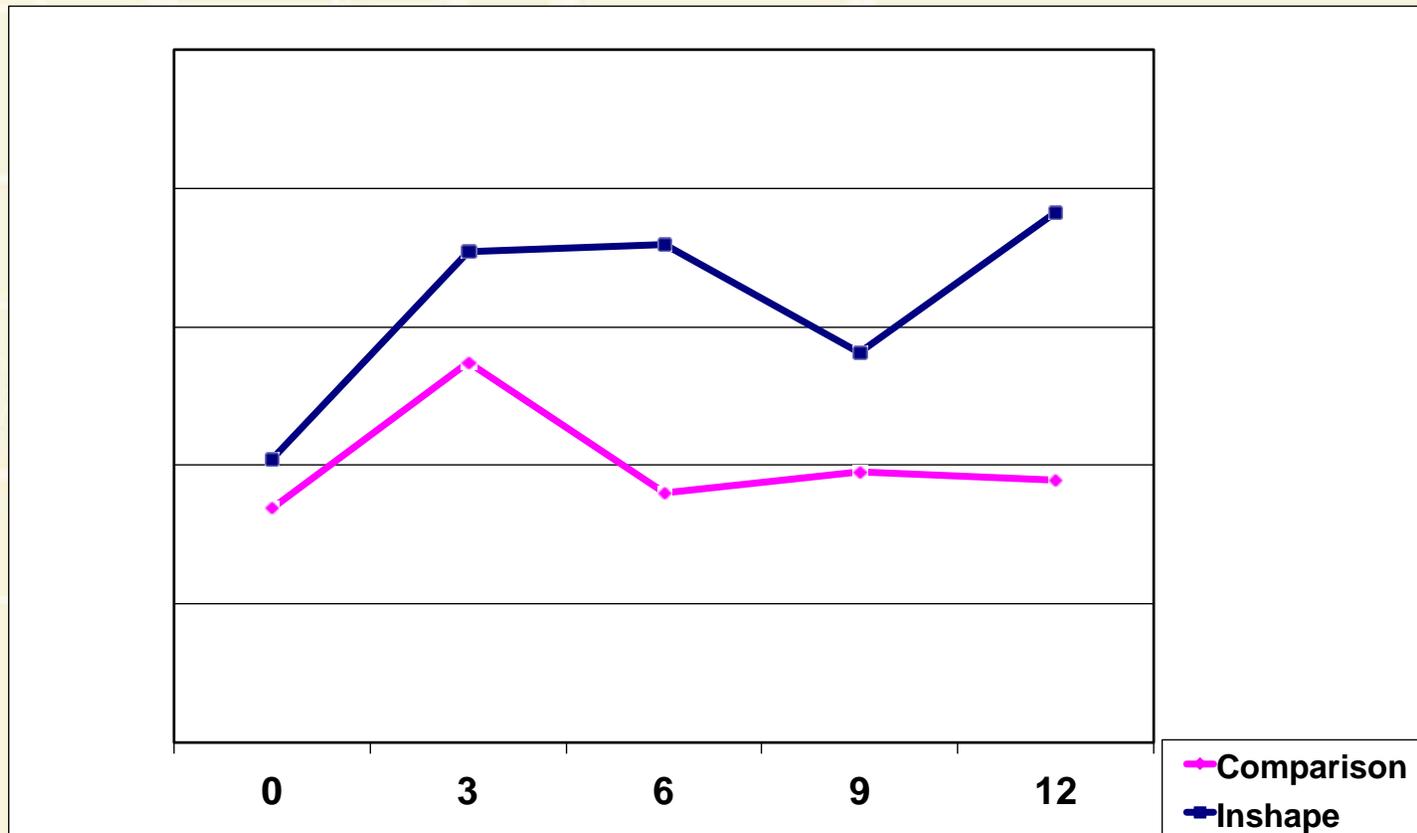
# In SHAPE Pilot Study Waist Circumference (n=76)



# In SHAPE RCT # 1: Exercise Capacity- 6 Minute Walk Test



# In SHAPE RCT # 1: Time Exercising (n=133)



p=.09



## **Second RCT of In SHAPE**

Health Promotion and Fitness for Younger and Older Adults  
With SMI

RCT (n=200) comparing In SHAPE to health club  
membership: overweight/obese adults with SMI

Longer duration (12 mo intervention, 18mo f/u)

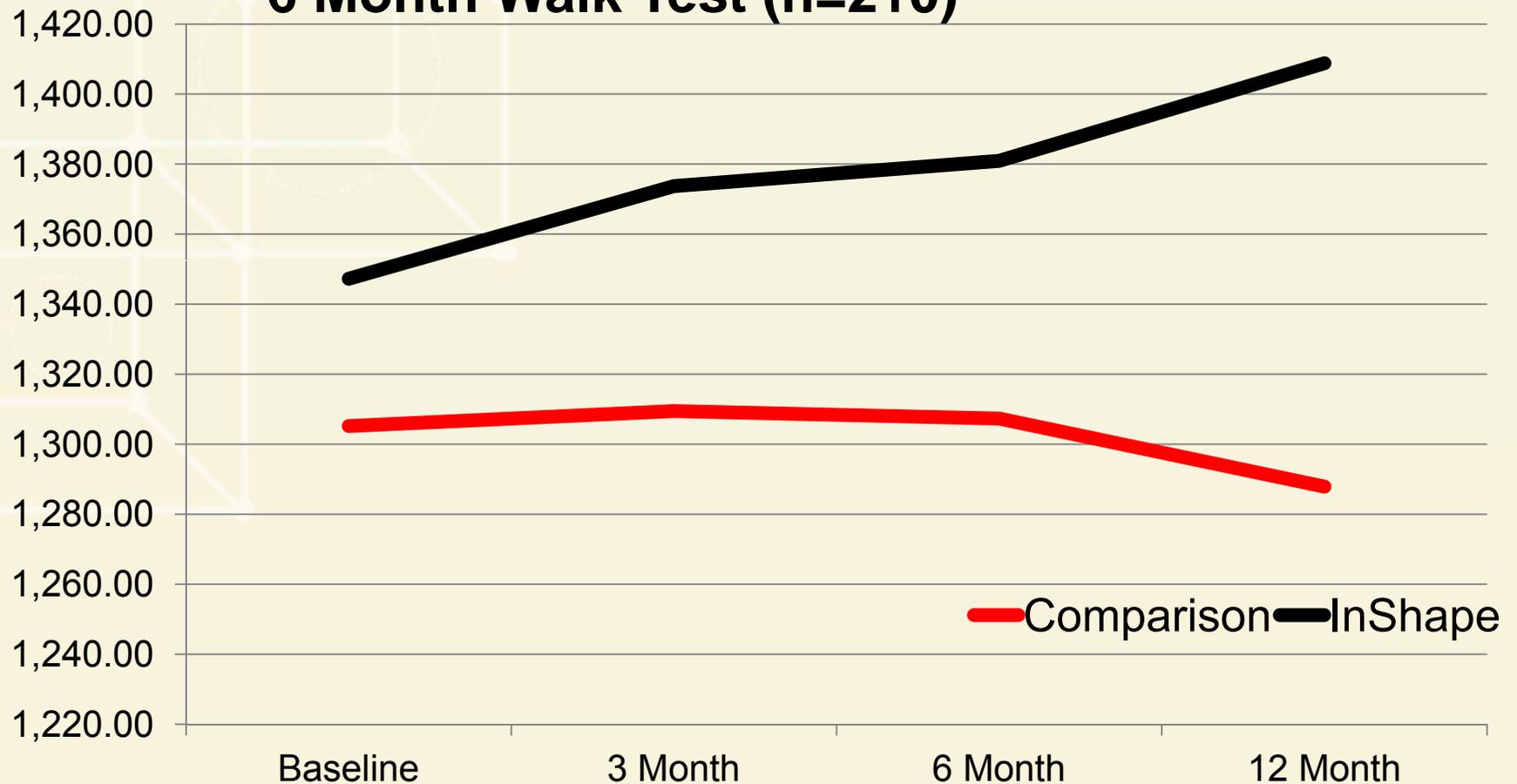
Greater emphasis on nutritional component in conjunction  
with physical activity

N=210 randomized

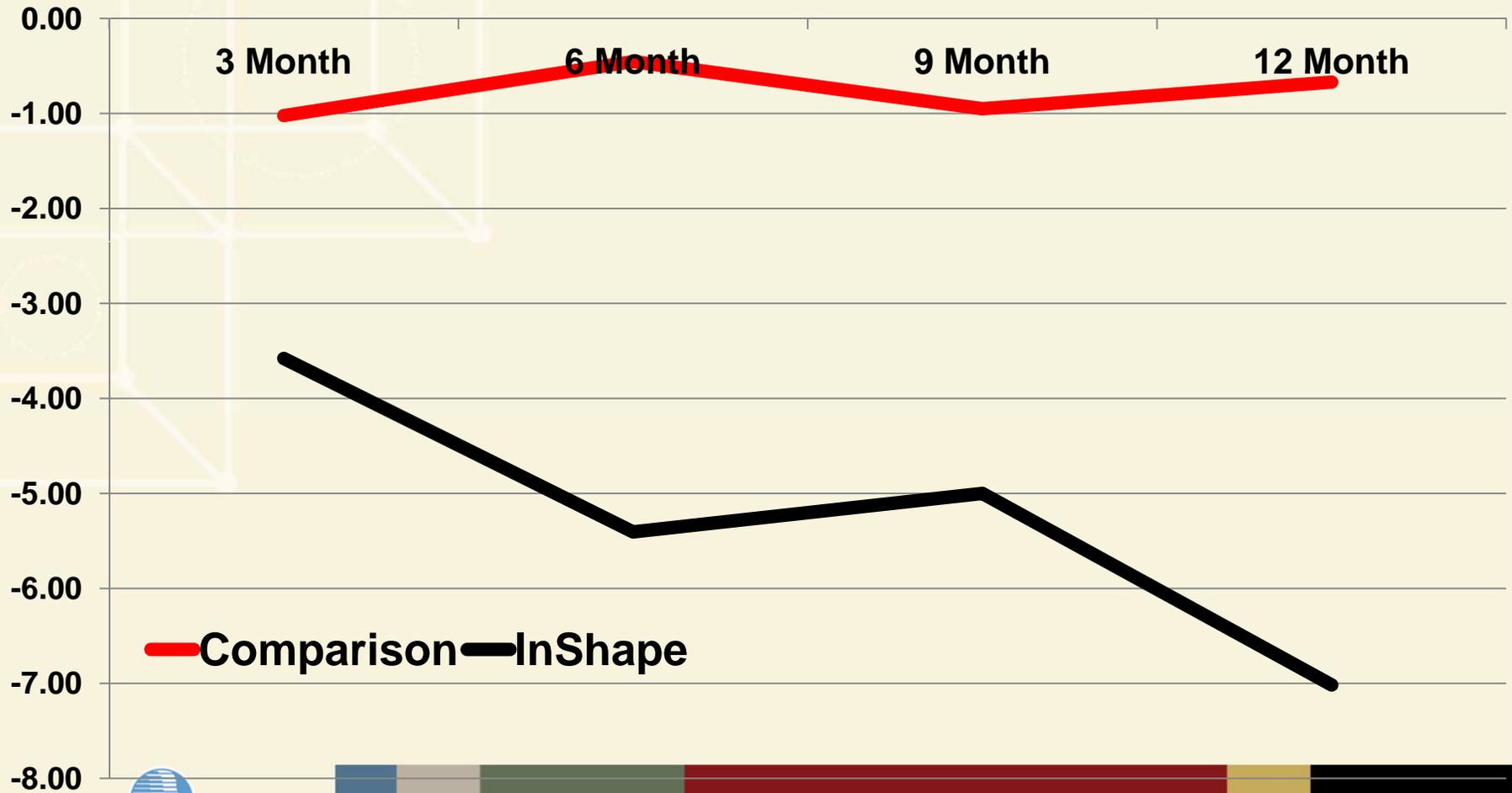
PI: Bartels NIMH R01MH078052



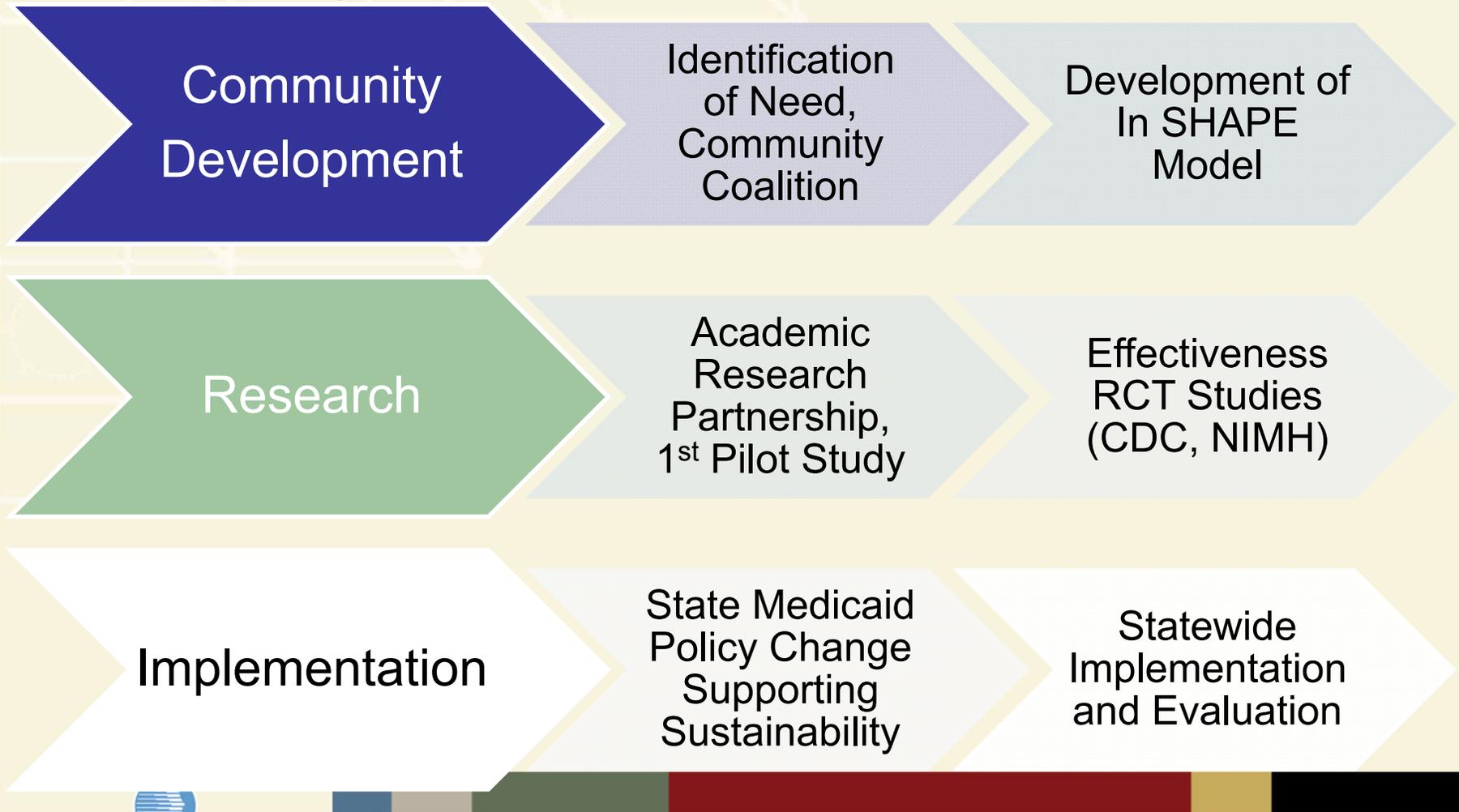
## In SHAPE RCT #2: Interim Results: 6 Month Walk Test (n=210)



## In SHAPE RCT #2: Interim Results: Mean Weight Change (n=210)



# Bridging the Gap from Community to Research to Population Health



# Implementation Science: What Does it Take to Successfully Implement Integrated Health Promotion?

Two Federally Funded Initiatives to Support State-wide Implementation of In SHAPE in New Hampshire:

- **Statewide Implementation Study:** Training, supervision and technical assistance for organizational change, leadership, and In SHAPE health mentor training
- **CMS Medicaid Wellness Incentive Program:** vouchers for fitness facilities and weight loss programs  
rewards for attendance at fitness facilities and smoking cessation



## **SUMMARY:**

- Most of the studies showed statistically significant weight loss
- Among the few studies reporting the proportion of individuals achieving clinically significant (>5%) weight loss as many as 38% met this goal
- Among the few studies reporting fitness (6MWT) even more achieved clinically significant improved fitness



## The Good News On Fitness

Gen. Pop. independent of obesity, smoking and age:  
8 year f/u:

vigorous activity group (22%) mortality = 4.2%  
remaining (78%) **2X** mortality = **8.2%**

16 year f/u:

compared to lowest one-third activity gp

Middle third = **23% reduced** mortality

Highest third = **32% reduced** mortality



## Recommendation:

### 1. Most likely to be effective:

- Longer duration
- Manualized combined education and activity-based approach
- Both nutrition and physical exercise
- Evidence-based (proven effective by RCTs)



## Recommendation:

### 2. Less likely to be successful:

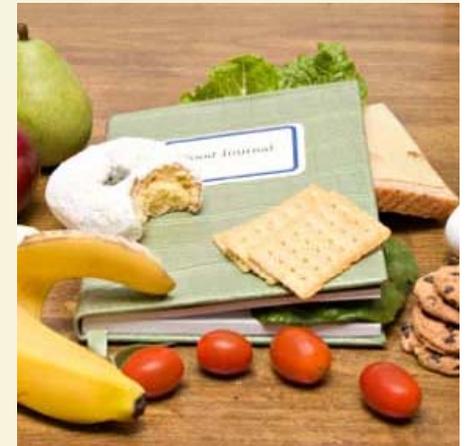
- Briefer duration interventions
- General wellness or health promotion education-only programs
- Non-intensive, unstructured, or non-manualized interventions
- Programs limited to nutrition only or exercise only (as opposed to combined nutrition and exercise).



## Recommendation:

3. *If weight loss is a primary goal:*

- The nutritional component is critical and is more likely to be successful if it incorporates active weight management
- Monitoring weight, changing diet and keeping track



## Recommendation:

### 4. *If physical fitness is a primary goal:*

- (+) Activity based programs that provide active and intensive exercise and monitoring of physical activity
- (-) Programs solely providing education, encouragement, or support for engaging in physical activity.



## **Recommendation:**

### *5. Integration of Evidence-based Health Promotion as a Core Service:*

- Evidence-based health promotion consisting of combined physical fitness and nutrition programs should be an integrated component of mental health services supporting wellness and recovery.



## Recommendation:

### 6. *Pursuing Weight loss vs. Fitness*



- Aggressively pursue dietary reform and weight management but also support the value of physical activity in achieving fitness independent of obesity.



## Recommendation:

### *7. Measuring Outcomes and Fidelity*



- Physical fitness and weight outcomes and program fidelity should be objectively and reliably measured as a core indicator of quality mental health services.



## Recommendation:

### 8. *Selecting a Health Promotion Program for Implementation:*



- Evidence-based: supported by rigorous outcome research (preferably RCTs)
- Manualized with training and supervision
- Feasible: Demonstrated track record of successful implementation and sustainability



## Future Research Directions?

- Financial incentives
- Use of smartphone and other technology for prompting, monitoring, and support of wellness
- Engaging families and social networks
- Peer led and peer supported interventions
- Ethnically and culturally tailored interventions
- Combined pharmacological and behavioral interventions
- Integrating smoking cessation and substance abuse Rx



## ***Conclusions: The Bottom Line***

- ***Both*** obesity and poor fitness are killers
- Changing health behaviors is **HARD** work but essential to improving health and life expectancy
- The best studies demonstrate modest results in reducing obesity but better results in improving fitness



## ***Conclusions: The Bottom Line***

- What works better? Intensive manualized programs that combine coached physical activity and dietary change lasting at least 6 months (or more).
- Clinically significant weight loss is likely to be achieved by some, but improved fitness by more..... both are important for heart health.



## ***Conclusions: The Bottom Line***

- Integrated health promotion interventions are feasible as a core component of mental health services for persons with SMI.
- Reducing obesity and improving fitness in adults with SMI is *challenging* but possible, and requires a multi-component, intensive, **evidence-based** approach.
- Successful implementation: leadership, culture change, fidelity, financing, training and TA.





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## **Questions and Discussion**

### **Recommendations for Implementing Integrated Evidence-based Models**

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