USING POSITIVE PSYCHOLOGY TO IMPROVE PAIN AND FUNCTIONING IN VETERANS WITH ARTHRITIS

CHERP
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RESEARCH AND PROMOTION

VA HSR&D CENTER OF INNOVATION

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Pain Management Cyberseminar
March 6, 2018

Disclosures

- The views expressed here are mine and do not represent those of the Department of Veterans Affairs or the United States Government.

- I have no financial conflicts to disclose.

Acknowledgements

Co-Investigators

- Said A. Ibrahim
- Rollin M. Gallagher
- C. Kent Kwoh
- Acacia Parks
- Ernest Vina
- Debra K. Weiner
- Ada Youk

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- Kaushal Desai
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Burden of Arthritis

- Affects half of U.S. adults over age 65[1]

- Major source of disability, causing more functional limitations than heart disease or diabetes[2]

- With no known cure, goals of treatment are to alleviate symptoms and improve functioning and quality of life

- Existing treatments yield small to moderate improvements in pain[3]
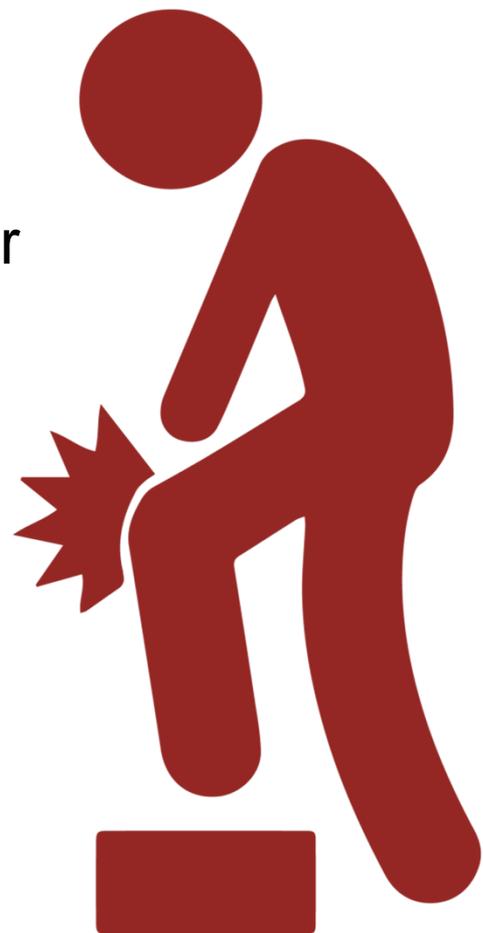
[1]*MMWR Morb Mortal Wkly Rep.* 2006;55:1089-92. [2]*MMWR Morb Mortal Wkly Rep.* 2009;58:421-426.
[3]Zhang et al. *Osteoarthritis Cartilage.* 2007;15:981-1000.

Well-Documented Race Disparities

- Impact: Among those diagnosed with arthritis, African Americans (AAs) report more severe pain and more daily limitations than whites[1]

- Treatments: AAs are less likely to receive some pharmacological and surgical treatments[2,3]

- Preferences: AAs are less likely to prefer pharmacological or surgical treatments and more open to complementary treatments[4,5]

[1]Bolen et al. *J Rheumatol.* 2006;33(11):2271-9. [2]Hausmann et al. *Arthritis Care Res (Hoboken).* 2017;69(8):1171-1178. [3]Dominick et al. *J Rheumatol.* 2003;30(10):2201-2206. [4]Ibrahim et al. *Arthritis Rheum.* 2001;45(4):340-345. [5]Hausmann et al. *J Gen Intern Med.* 2010;25(9):982-988.

BIOLOGICAL
Health status
Disease severity
Obesity

Pain & Function

PSYCHOLOGICAL
Depression, Mood
Self-efficacy
Coping, Catastrophizing

SOCIAL
Stress
Support
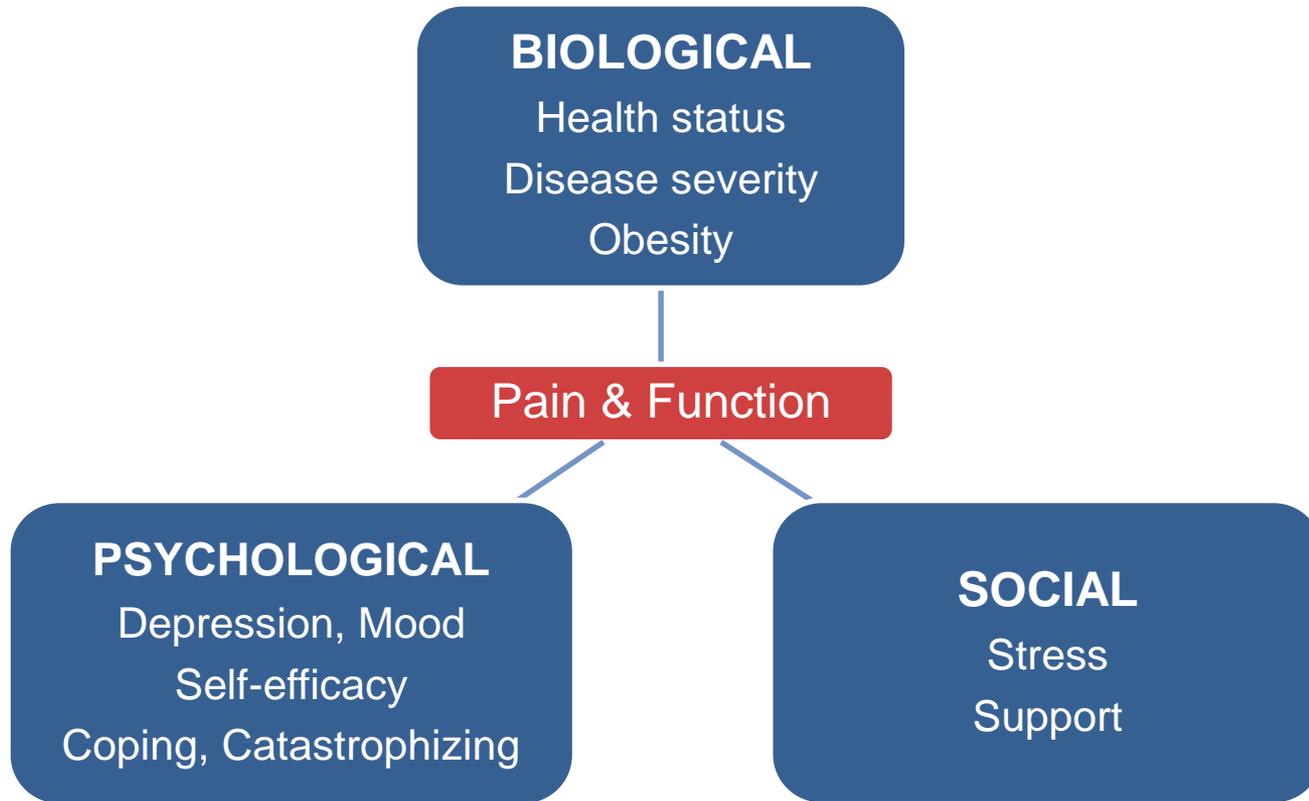
Targeting psychosocial factors may improve, and reduce disparities in, pain and function

Positive Psychology as a Possibility

- The Idea: Improve health by increasing positive emotions and behaviors (vs. treating disease and symptoms)

Broaden

Transform

Positive Emotions

Joy, love, contentment, interest, happiness

Expands inventory of thoughts and action

Develops physical, mental and social resources

Build

Advances personal growth and creates more positive emotions
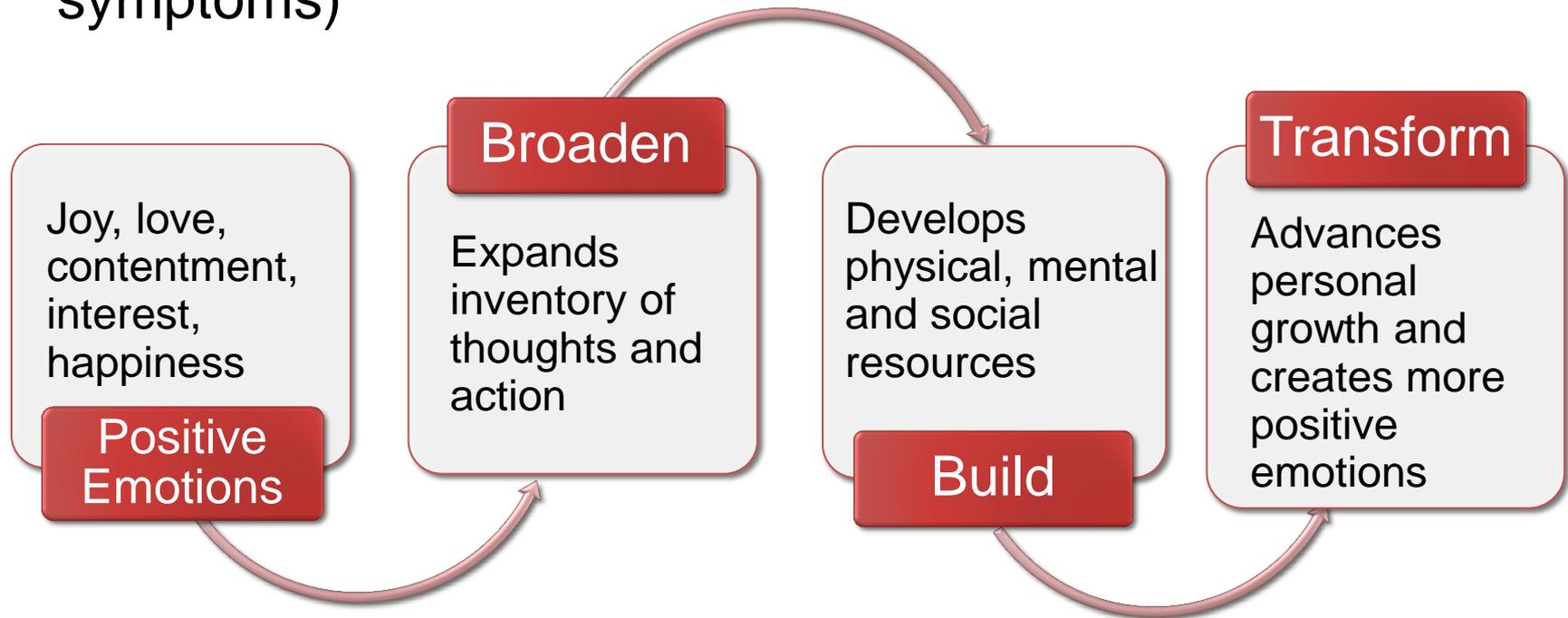
Broaden-and-Build Theory of Positive Emotions (Frederickson 2001)

Positive Activities Improve Health

- Simple positive activities have been developed and tested[1]

  - Common exercises focus on gratitude, kindness, optimism, identifying/using personal strengths, reflecting on good things

- Positive activities improve mental well-being and reduce depressive symptoms[1]

- Positive activities and emotions are associated with reduced mortality and morbidity[2]

[1]Bolier et al. *BMC Public Health*. 2013;13:119.
[2]Pressman et al. *Psychol Bull*. 2005;131:925-971.

Can Positive Activities Reduce Pain?

- Overview
  - Secondary analyses of data from an online trial that randomized volunteers to complete 0, 2, 4, or 6 positive activities over 6-weeks[1]

[1]Hausmann et al. *J of Pain.* 2014;15(5):560-567.

Online Trial Details

- Sample

  - Volunteers visiting a positive psychology website

  - Sample restricted to those who reported at least mild to moderate pain at baseline (score <67 on SF-36 Bodily Pain subscale)

- Outcome

  - Change in bodily pain from baseline to post-intervention (6 weeks) and at 1, 3, and 6 months post-intervention

- Procedure

  - Everyone received weekly emails to return to website to complete follow up surveys

  - The 2, 4, and 6-activity groups received instructions for weekly positive activities

Hausmann et al. *J of Pain.* 2014;15(5):560-567.

Online Trial Positive Activities

Week	Activity
1	**Three Good Things:** Identify 3 things that went well each day and reflect on why they occurred
2	**Strengths:** Complete a survey that identifies one's strengths and then use a top strength each day
3	**Gratitude Visit:** Write a letter of gratitude and read it aloud to the recipient
4	**Savoring:** Focus intently on positive experiences 2 to 3 times each day
5	**Active-Constructive Responding:** Practice responding positively to good news shared by others
6	**Life Summary:** Write a summary of how one wants to be remembered

Hausmann et al. *J of Pain.* 2014;15(5):560-567.

Online Trial Sample Characteristics

Characteristic	Analytic Sample (N = 417)
Age, m (SD)	46.6 (12.2)
Female, %	82.5
Married/living with partner, %	56.1
Education, %	
< 4-year college degree	28.8
4-year college degree	23.3
> 4-year college degree	48.0
Income, %	
< $20K	14.2
$20K-$59K	37.2
$60K-$99K	26.1
> $99K	22.5
Mental health (SF-36), m (SD)	54.9 (21.0)
Currently depressed, %	38.4
Undergoing mental health treatment, %	44.7
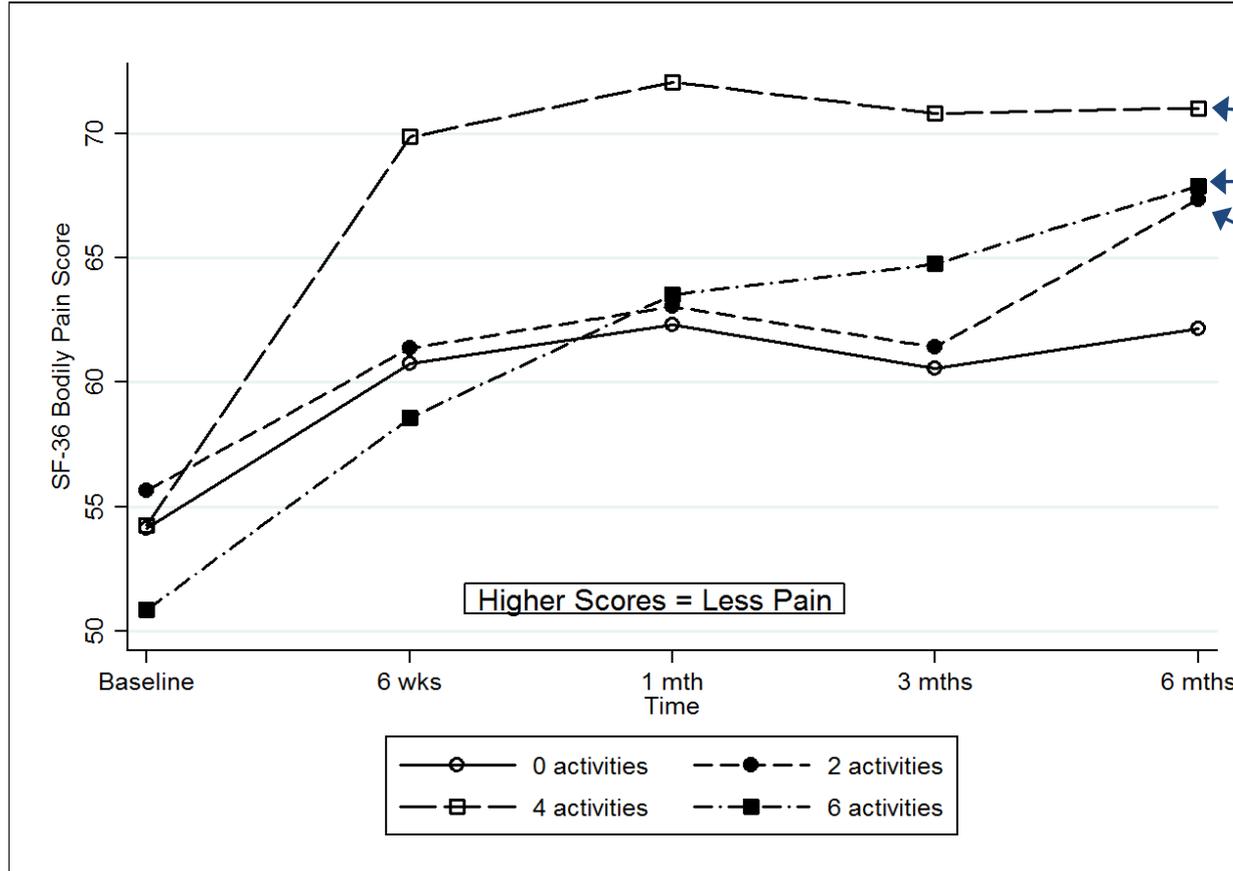
*Greater change from baseline to 6 months (Vs. 0-activity group; $p < 0.05$)

Bodily pain improved in 4- and 6-activity groups (vs. 0-activity group)

Hausmann et al. *J of Pain.* 2014;15(5):560-567.

Online Study Limitations

- High attrition
- Self-selected convenience sample
- Crude pain measure; no information on duration, intensity, or source of pain

Bringing Positive Psychology to Veterans

- Goals
  - Translate evidence-based positive activities into behavioral program for Veterans with knee or hip arthritis
  - Demonstrate the impact of the positive activities program on pain and function in this population
  - Test whether the program is more beneficial for African Americans, thus reducing disparities
- Three phases
  - Phase 1: Develop and refine materials
  - Phase 2: Pilot test for feasibility, acceptance, and impact on pain and function
  - Phase 3: Multi-site randomized control trial

Phase 1, Step 1: Identify Positive Activities

- Consulted literature to identify activities that:
    - Have demonstrated positive effects on wellbeing lasting for at least 1 month
    - Are simple to complete
    - Do not require extensive training or follow-up
    - Work when self-administered
    - Could be adapted for use by those with low literacy

Selected Positive Activities

Name and Description
Three Good Things: Write down 3 good things that happened each day.
Gratitude Letter: Write a letter to someone whose actions affected you but you never thanked. Deliver the letter in person, if possible.
Savoring Pleasures: Spend at least 2-3 minutes savoring an experience each day. Write down what you savored, how you savored it, and how it made you feel.
Acts of Kindness: Do 5 acts of kindness in a single day. Write down what you did, how it made you feel, and how the recipient responded.
Increasing Pleasant Activity: Identify pleasant activities (from a provided list or on your own) you want to do during the next week. Write them on a weekly planner (also provided) and keep track of which days you did each activities.

Neutral Control Activities

Name and Description
Reflecting on Life Events: Write down 3 things that affected you each day.
Changing your Circumstances: Describe something you want to change about your life circumstances, why you think the change would be good, and how you could make the change.
Getting Organized: Create a mental outline of everything you have done in the past 7 days and then write down the activities.
Early Memories: Each day, write down an early memory, how it made you feel, and who you were with.
Planning the Future: Think about what you are going to do in the next week. Write down your plans for each day.

Phase 1, Step 2: Gather Feedback

- Sample (N=10)
  - Military Veterans
  - Age 50 or older
  - Symptomatic knee or hip arthritis (pain rating $\geq$ 4 on 0-10 scale)
  - Received primary care from the VA
- Procedure: Semi-structured interviews
  - For each activity, Veterans reviewed instructions and were asked:
    - Would you be likely to complete the activity (why or why not)?
    - How could the activity or instructions be improved?

Phase 1, Step 3: Refine Activities

- Overall response was positive
- Veterans indicated they would complete all activities
- Based on how long it took Veterans to read instructions and comments made about some of the activities, we:
  - Revised entire booklet to be written at 4th grade reading level (originally a 6th grade level)
    - Changed "Savoring Pleasures" to "Making Good Moments Last"
    - Changed "Gratitude Letter" to "Expressing Thanks"
    - Revised "Increasing Pleasant Activities" to fit on 2 pages (vs. 3)
  - Provided examples for some of the activities

Phase 1 Final Product:
Staying Positive with Arthritis Booklets

Component	Positive Activities Booklet	Control Activities Booklet
Cover page		
Introduction		
Activity 1	Three Good Things	Events that Affect You
Activity 2	Expressing Thanks	Changing Your Circumstances
Activity 3	Acts of Kindness	Early Memories
Activity 4	Making Good Moments Last	Getting Organized
Activity 5	Increasing Pleasant Activity	Planning the Future
Activity 6	Practice your Favorite(s)	Practice your Favorite(s)

Cover and Introduction

Staying Positive with Arthritis

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VAPHS
VA **Pittsburgh** Healthcare System

Welcome to the Staying Positive with Arthritis Study!

What is this study about?
The goal of this study is to teach people with arthritis simple activities they can do to stay positive.

Why is staying positive good for people with arthritis?
Living with arthritis can be hard. The good news is that you can learn to notice and enjoy the good things in life, even when you have pain. Building habits to help you stay positive can help you cope with the challenge of arthritis.

What will I do in this study?
You will learn how to do simple activities that might improve your well-being. Most activities will take about 20 minutes to do.

This workbook has instructions for each activity. You will complete 1 activity each week for the next 6 weeks.

A member of our research team will also call you for about 10 minutes each week. We will ask how things are going and review the next activity.

We will also call you 1, 3, and 6 months after you finish the program to ask about your health and well-being. These calls will take about 45 minutes each.

What else should I know before I start?
Each activity works better for some people than for others. We ask that you try each one so you can find the ones that work best for you. Try to complete each activity the best you can.

Call us if you need help or have questions. You can reach us at **(412) 954-5261**.

Three Good Things (Positive)

Activity 1: Three Good Things

Sometimes we focus on what goes wrong instead of what goes right. This is because we remember bad things more easily than good things. To prevent this, we need to practice thinking about good things in life. This activity will help you get started.

Every night this week before you go to bed:

1. Think about your day. Identify 3 good things that happened that day. They can be big or small things. They should be specific things that happened that day, not things you are grateful for in general.

2. Write your 3 good things each day this week on the next page. Try to write down different good things that happened each day.

3. At the end of the week, look back on all the good things that happened and remember how they made you feel.

Here is an example:

Day 1

Good things that happened today
#1: *woke up feeling good*
#2: *had lunch with my friend*
#3: *someone on the bus stood up so I could sit down*

Day 1

Good things that happened today
#1:
#2:
#3:

Day 2

Good things that happened today
#1:
#2:
#3:

Day 3

Good things that happened today
#1:
#2:
#3:

Day 4

Good things that happened today
#1:
#2:
#3:

Day 5

Good things that happened today
#1:
#2:
#3:

Day 6

Good things that happened today
#1:
#2:
#3:

Day 7

Good things that happened today
#1:
#2:
#3:

Events that Affect You (Control)

Activity 1: Events that Affect You

It is important to be aware of how we are affected by events or circumstances in our lives. This activity will help you learn to identify things that affect you.

Every night this week before you go to bed:

1. Think about your day.

2. Identify 3 things that affected you that day.

3. Write your 3 events each day this week on the next page.

Here is an example:

Day 1

Things that affected me
#1: *overslept my alarm*
#2: *had a doctor's appointment*
#3: *there was roadwork so I took a different way home*

Day 1

Things that affected me
#1:
#2:
#3:

Day 2

Things that affected me
#1:
#2:
#3:

Day 3

Things that affected me
#1:
#2:
#3:

Day 4

Things that affected me
#1:
#2:
#3:

Day 5

Things that affected me
#1:
#2:
#3:

Day 6

Things that affected me
#1:
#2:
#3:

Day 7

Things that affected me
#1:
#2:
#3:

Phase 2

- Pilot test for feasibility, acceptance, and impact on pain and function

Method

- Target sample: Same as Phase 1
- Patients were recruited through direct mailings and through brochures in primary care clinics
- Procedure

Screen for Eligibility	Baseline Assessment & Randomization	6-Week Positive Intervention or Control Program	1-Month Follow-Up	3-Month Follow-Up	6-Month Follow-Up
Telephone Survey	*In-Person Visit*	*Weekly At-Home Activities and Telephone Calls*	*Telephone Survey*	*Telephone Survey*	*Telephone Survey*

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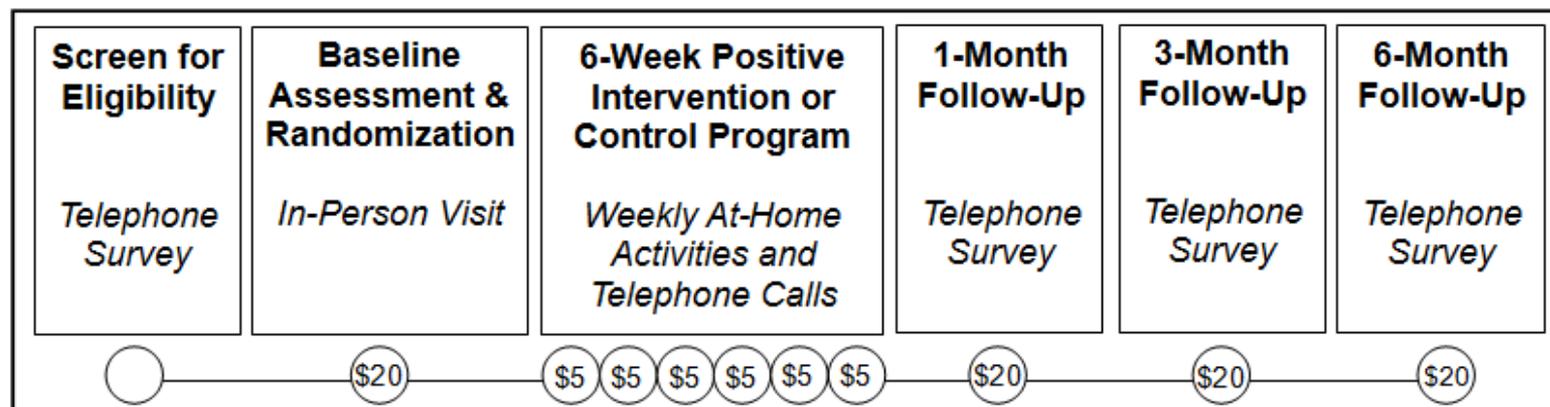
Outcomes

- Primary: Pain and functioning
  - Pain (5-items) and difficulty functioning (17 items) subscales of the Western Ontario MacMaster (WOMAC) Osteoarthritis Index[1]
  - Scores range from 0 to 100 (higher scores = worse)
- Secondary: Measures of wellbeing
  - Positive and negative affect[2]
  - Satisfaction with life[3]

[1]Bellamy et al. *J Rheumatol.* 1988;15(12):1833-1840. [2]Thompson. *J Cross Cult Psychol.* 2007;38(2):227-242. [3]Diener et al. *J Pers Assess.* 1985;49(1):71-75.

Adherence and Engagement

- Number of weekly calls completed
- Number of activities completed
- Ratings of the benefit, enjoyment, and difficulty of each activity on 7-point Likert scales

Analyses

- Linear mixed models were used to examine change in pain and function from baseline to 6 months

Sample Demographics

Characteristic	Sample (N = 42)
Age, m (SD)	67.5 (10.3)
Female, n (%)	7 (16.7)
Race, n (%)	
Black	18 (42.0)
White	24 (58.0)
Married/living with partner, n (%)	25 (59.5)
Employment status, n (%)	
Employed	7 (16.7)
Retired	22 (52.4)
Unemployed or disabled	13 (31.0)
High school education or less, n (%)	15 (35.7)
Income, n (%)	
< $20K	14 (35.9)
$20K-$49K	13 (33.3)
$\geq$ $50K	12 (30.1)

Clinical Characteristics

Characteristic	Sample (N = 42)
Excellent or very good health, n (%)	15 (35.7)
Charlson comorbidity index (range: 0-25), m (SD)	3.7 (2.8)
Prior diagnosed anxiety disorder, n (%)	14 (33.3)
Prior diagnosed depressive disorder, n (%)	20 (47.6)
Being treated for mental or emotional condition, n (%)	14 (33.3)
Depressive symptoms (PHQ-8), n (%)	
None or mild	26 (61.9)
Moderate to severe	12 (28.6)
Pharm treatments for arthritis (range: 0-6), m (SD)	1.8 (1.0)
Non-pharm treatments for arthritis (range: 0-13), m (SD)	2.2 (1.6)
Less than adequate health literacy, n (%)	42 (100.0)

Hausmann et al. *Pain Med.* 2017;18(10):1908-1920.

Adherence and Engagement

Completion of Follow-Up Calls and Activities	Total Sample (n = 42)		Positive Group (n = 21)		Control Group (n = 21)		
	N	%	N	%	N	%	p
Completed ≥5 of 6 follow-up calls	33	(78.6)	16	(76.2)	17	(81.0)	0.99
Completed ≥5 of 6 activities	27	(64.3)	13	(61.9)	14	(66.7)	0.75
Ratings of Weekly Activities*	M	(SD)	M	(SD)	M	(SD)	p
Perceived benefit	5.3	(1.1)	5.2	(1.4)	5.3	(.9)	0.75
Perceived enjoyment	5.4	(0.9)	5.4	(1.0)	5.4	(0.8)	0.96
Perceived difficulty	2.0	(1.0)	1.8	(0.9)	2.3	(1.0)	0.13

*Activities were rated on 7-point Likert scales (1 = not at all and 7 = extremely)

Primary Outcomes

Pain
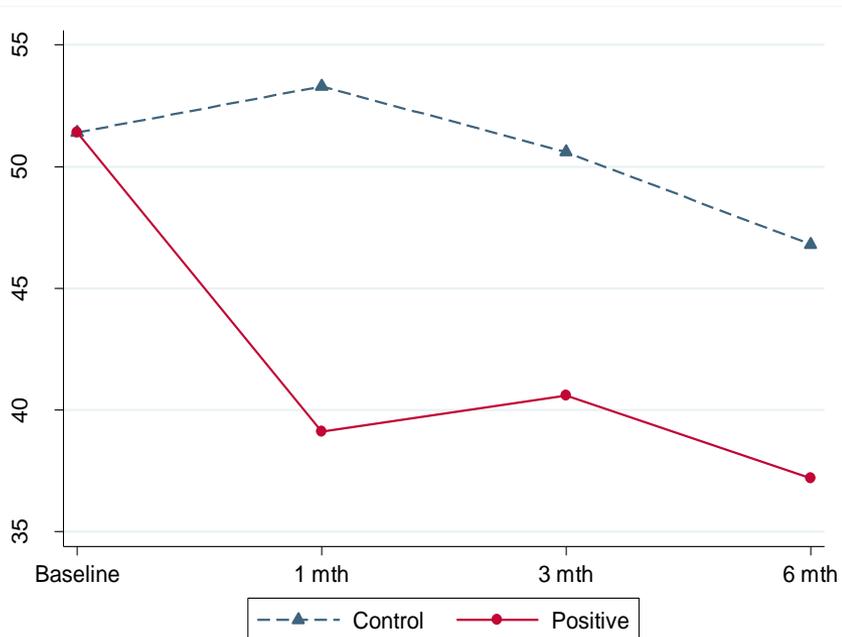
χ^2 = 6.65, p = 0.08, Cohen's d = 0.66

Difficulty Functioning

χ^2 = 9.74, p = 0.02 , Cohen's d = 0.86

Hausmann et al. *Pain Med.* 2017;18(10):1908-1920.
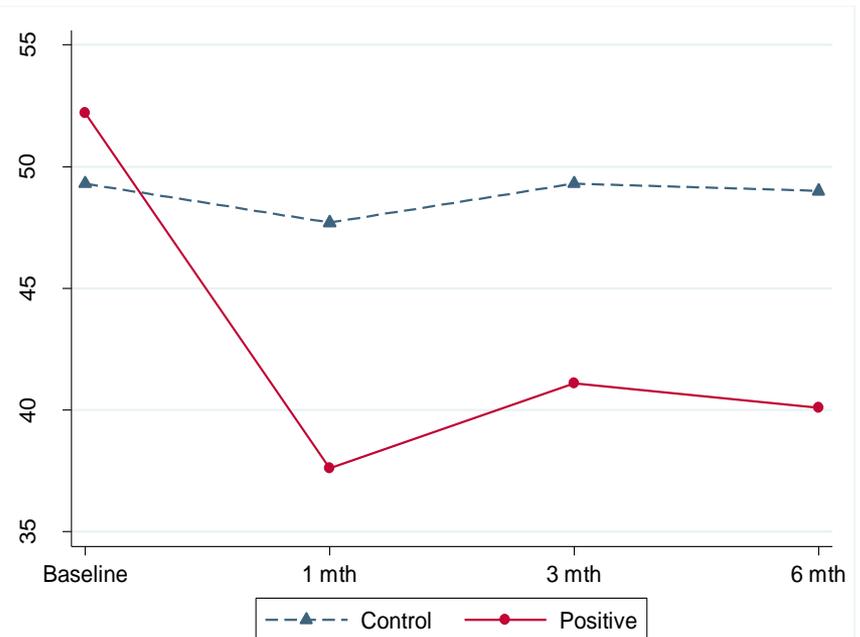
Secondary Outcomes

Positive Affect
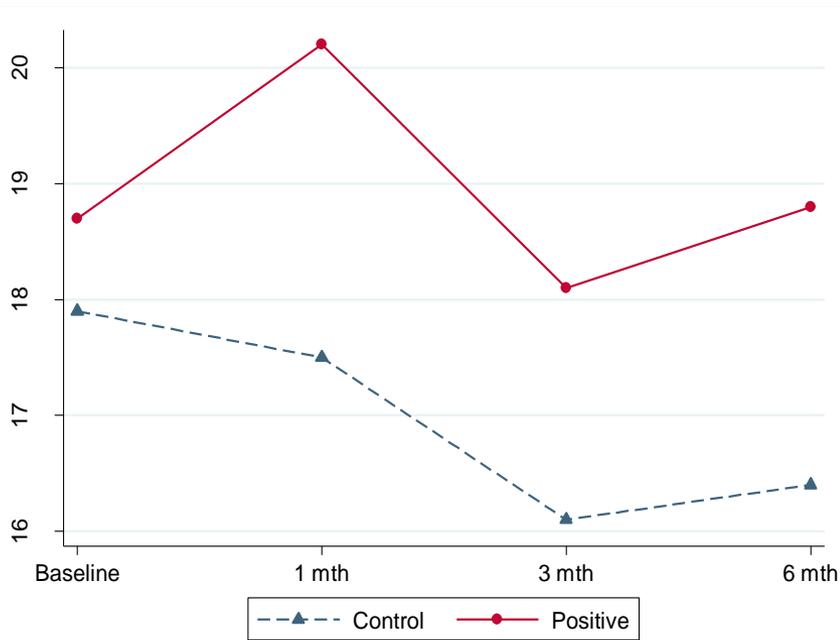
χ^2 = 1.67, p = 0.64, Cohen's d = 0.35

Negative Affect

χ^2 = 9.14, p = 0.03 , Cohen's d = 0.50

Hausmann et al. *Pain Med.* 2017;18(10):1908-1920.
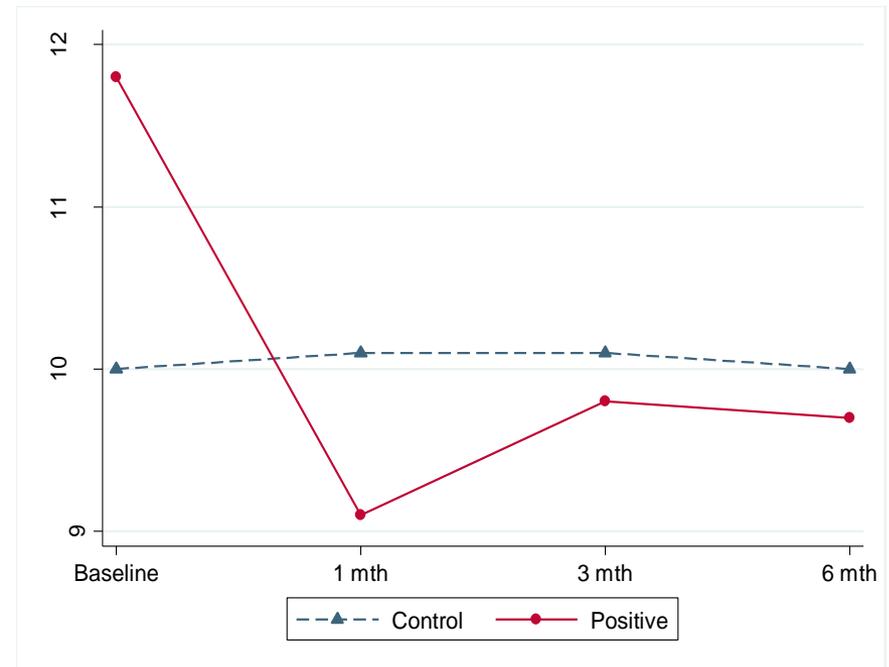
Secondary Outcomes

Satisfaction with Life

χ^2 = 9.72, p = 0.02, Cohen's d = 0.36

Hausmann et al. *Pain Med.* 2017;18(10):1908-1920.
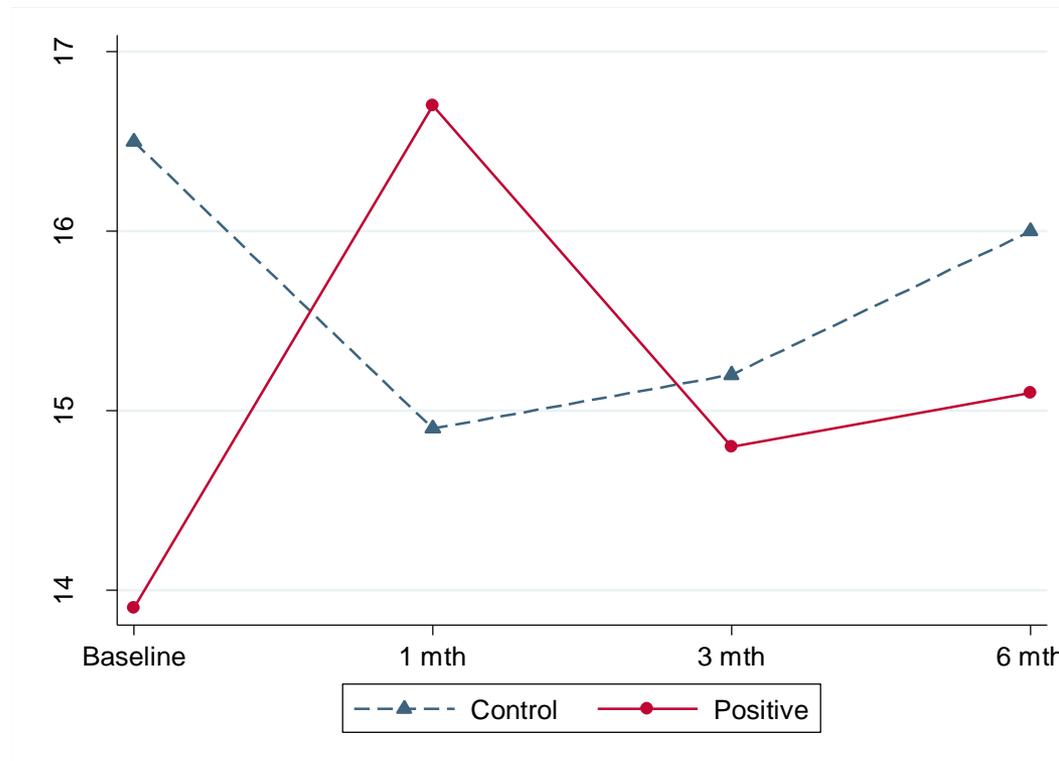
Pilot Summary

- Veterans with knee or hip arthritis were successfully recruited and retained

- Retention and ratings of activities were similar across positive and control groups

- Compared to control group, positive group showed:
  - Significant improvement in self-reported functioning
  - Non-significant improvement in self-reported pain
  - Significant improvement in negative affect and life satisfaction
  - No difference in positive affect

Limitations

- Single site

- Small sample

- Not powered to detect race differences

- Few females

Phase 3

Staying Positive:
An Intervention to Reduce Osteoarthritis Pain Disparities (VA IIR 13-080)

Hausmann et al. *Contemp Clin Trials.* 2018; 64:243-253.

Pilot Study vs. Main Study

Feature	Pilot Study	Main Study
Sample size	N=42	N=360
Sites	Pittsburgh	Pittsburgh & Philadelphia
Recruitment strategy	Opt-in for screening	Opt-out of screening
Workbooks		New color scheme Re-ordered control activities Tweaked some examples
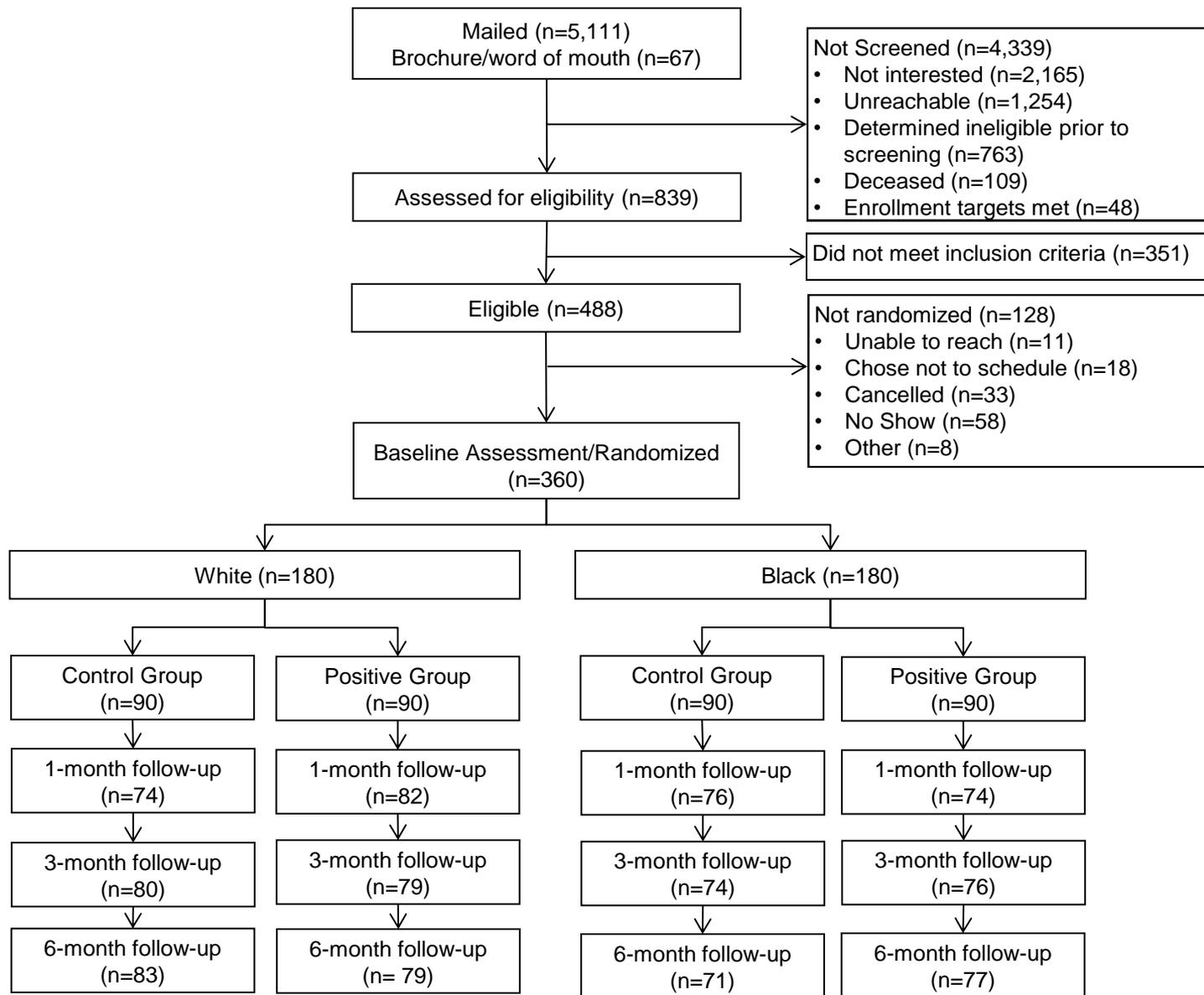
Study Status

- Analyses underway with original target cohort
  - N=360; 85 women
- Preparing data from expanded cohort for additional analyses
  - N=517; 139 women

Preliminary Findings

Pilot Study

2014: Maddie Bowman celebrated after winning the gold, holding up the American flag.
Image Source: Getty / Cameron Spencer

Main Study

2018: Maddie Bowman lays on the snow after a fall in the women's freestyle skiing halfpipe final.
JACK GRUBER, USA TODAY SPORTS

What happened?!

- Overly inclusive eligibility criteria?
  - Mean pain at baseline was 48.8 (sd=17.6) on 100-point scale
  - Restricting analyses to those with >median baseline pain yields same pattern
- Was there non-adherence?
  - 66% entirely or partially completed at least 5 of 6 activities
  - Restricting analyses to that 66% yields same pattern
- Were activities too difficult?
  - Mean difficulty rating of 2.2 (SD=1.8) difficulty on 7-point scale
- Were there benefits that weren't captured by our survey measures?
  - Anecdotal comments indicate that some Veterans REALLY liked the program

Comments from Positive Group

"At first I thought this program was a pain in the a**. Then, as I started to do it, I saw that the point was not to be too depressed about the pain. It's easy to get down when you're hurting, but it's good to notice that nice things are still happening in life."

"Glad it helped me a little with the pain. I used less medication."

"Most of the things with the study are keeping me positive. Most of the things I did, I've been doing but now I pay attention to them. It not only has been beneficial to me but to my family too. I enjoyed being in it."

"There needs to be more programs like this."

Comments from Control Group

"I enjoyed this whole study. I enjoyed it very well and I think it benefited me. I feel pretty great and I think being positive is a big factor in health."

"I think it has helped a lot with pain. I don't have as much pain as when the study started. The activities are good to take your mind off the pain."

"I think I've become a little more attentive to my arthritis. I do the most positive things I can and try to enjoy them. I would recommend this to someone else."

"Whoever thought of this is a genius."

Next Steps

- Finalize and publish main outcomes

- Conduct gender comparisons with expanded cohort

- Analyze open-ended comments to identify where additional cultural adaptations are needed

THANKS!

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